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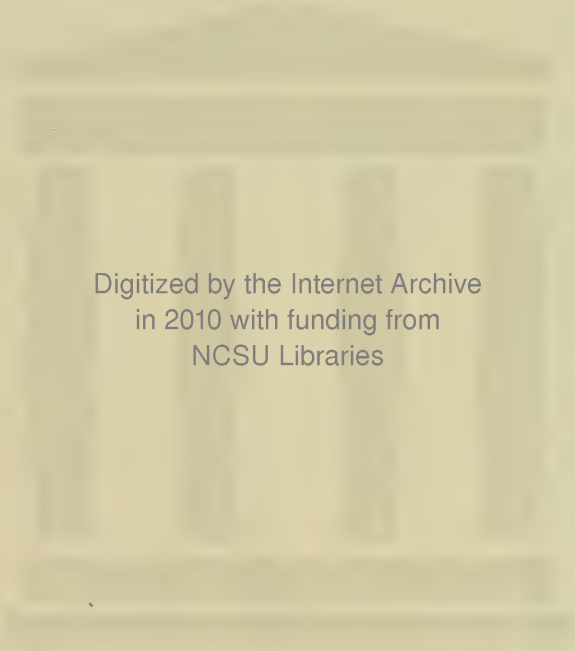

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THE RURAL ECONOMY OF NORFOLK:

COMPRISING THE

Management of Landed Eſtates,

AND THE

PRESENT PRACTICE of HUSBANDRY IN THAT COUNTY.

By Mr. MARSHALL,

(Author of MINUTES OF AGRICULTURE, &c.)

RESIDENT upwards of Two Years in NORFOLK.

THE SECOND EDITION.

VOL. II.

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M,DCC,XCV.

1795

ADDRESS

TO THE

READER.

IN regiſtering the practice of this Diſtrict, I purſued a two-fold method. Such eſtabliſhed rules of management as are generally obſerved in common practice, I committed to a SYSTEMATIZED REGISTER, as they occurred to my obſervation. But ſuch particular operations, and peculiarities of management, as required an accurate detail of circumſtances;---alſo ſuch complex obſervations, as included a plurality of ſubjects;---alſo ſuch inſtances of practice and opinion, as I found peculiar to individuals;---I reduced to MINUTES, in ſeries with thoſe on my own practice.

In preparing theſe materials for publication, I was deſirous, on the principle of ſimplicity, to have united the two regiſters: that is, to have incorporated the MINUTES with the ſyſtematized matter. But this I found entirely incompatible with the ſimplicity I was ſeeking. Many of the individual Minutes pertaining to a variety of diſtinct ſubjects, would not aſſimilate with any *one* of them; while others were, in ſtrictneſs, foreign to the ſyſtem of practice prevalent in the Diſtrict; being upon incidents in my own practice, and upon obſervations and reflections on ſubjects not eſpecially connected with the rural affairs of Norfolk, but equally relative to the rural economy of the Iſland at large.

Thus, ſeeing the neceſſity of keeping the two regiſters diſtinct, in ſome degree, I thought it right to let them remain (with a few exceptions) in the manner in which they were written; but, in order to connect them as intimately as the nature of them would admit of, I digeſted the ſubjects of the

the MINUTES, and ſuſpended them to their correſponding ſubjects in the SYSTEM; through which means the two regiſters may be read together, or ſeparately, at the option of the reader.

I was induced to adopt this method, with leſs heſitation, as I am ſtill more and more convinced that PRACTICAL KNOWLEDGE is never conveyed more forcibly than in MINUTES, made while the MINUTIÆ of practice are freſh in the memory, and the attendant CIRCUMSTANCES are ſtill preſent to the imagination. Nor am I ſingular in this opinion. A maſterly writer conveys the ſame ſentiment, in more elegant language. "It muſt," ſays he, "be acknowledged, that the methods of diſquiſition and teaching may be ſometimes different, and on very good reaſon undoubtedly; but, for my part, I am convinced that the method of teaching which approaches moſt nearly to the method of inveſtigation, is incomparably the beſt; ſince, not content with ſerving up a few barren and lifeleſs

truths, it leads to the ſtock on which they grew: it tends to ſet the reader himſelf in the track of invention, and to direct him into thoſe paths in which the author has made his own diſcovery, if he ſhould be ſo happy as to have made any that are valuable."

I will place this ſubject in a light comparative with two of the learned profeſſions. MINUTES, in rural economy, are as CASES in phyſic and ſurgery, and as REPORTS in law. They are all, and equally, if equally authentic, PRACTICE IN ITS BEST FORM. For an agriculitor cannot regiſter an incident,---a ſurgeon, a caſe,---nor a lawyer, the proceedings and deciſion of a court, with any degree of accuracy and perſpicuouſneſs, until he has aſcertained, and ſet before him, the facts and attendant circumſtances reſpecting it;---and has revolved in his mind the cauſe, the operation, and the effect. In doing this, he not only finds it neceſſary to aſcertain minutial facts and circumſtances, which, otherwiſe, he would have overlooked; but is led on, by reflection,

tion, to inferences which, otherwiſe, would not have occurred to him: and, if he regiſter fully and faithfully, he knows no more of the given ſubject when he has finiſhed his regiſter, than the perſon who may, afterwards, have read it. Conſequently, he not only thereby renders his practice more valuable to himſelf; but, by reading his report, his minute, or his caſe, the ſtudent gains full poſſeſſion of the practice of a practitioner.---Hence, principally, a barriſter is enabled to ſtep into court, and a phyſician into a ſick room, without the aſſiſtance of ſelf-practice.

I will place theſe ſubjects in another point of view. The attorney, the apothecary, and the common farmer, are enabled to carry on their reſpective profeſſions, or callings, without thoſe ſcientific helps.--- The former depend upon the practice of their maſters, and their own practice, during their clerkſhip, or apprenticeſhip; as the farmer does upon that of his father, and the country he happens to be bred in. But

why do we, in difficulties, fly from the apothecary to the phyſician, and from the attorney to the counſellor? Becauſe they have ſtudied their profeſſions ſcientifically, have obtained a general knowledge, and taken comprehenſive views, of their reſpective ſubjects;---as well as of the ſciences and ſubjects which are allied to them; and, added to theſe ſcientific aids, have made themſelves maſters of the practice, and the opinions, of the able practitioners who have gone before them; as well as of COTEMPORARY PRACTITIONERS.

With reſpect to the following MINUTES, it only remains neceſſary to ſay, that they were written in an active ſcene, and that more attention was paid to circumſtances than to language. Thoſe on huſbandry were written, as I conceive all minutes on the ſubject ought to be written, in the FAMILIAR LANGUAGE OF FARMING; and, many of them, in the provincial phraſeology of the Diſtrict they were written in. I confeſs, however, that, in reviſing them for

for publication, I thought it prudent to do away ſome of the FAMILIARISMS of the original Minutes. If, in the preſent form, they furniſh ſuch PRACTICAL DATA and NATURAL FACTS as may, in the end, be ſerviceable to the main deſign, and, in the inſtant, be acceptable to PRACTITIONERS, and uſeful to the STUDENT, the intention of publiſhing them will be fully obtained.

London, Feb. 1, 1787.

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MINUTES.

MINUTES

IN

NORFOLK.

1.

1780. SEPTEMBER 22d. THIS morning, measured a sheepfold, set out for 600 sheep, consisting of ewes, wedders, and grown lambs. MANURE.

It measures eight by five-and-a-half rods, or forty-four square statute rods; which is somewhat more than seven rods to a hundred, or two yards to a sheep. SHEEP.

2.

OCTOBER 27th. A few weeks ago a tenant asked for some topwood to under-drain part of a close of arable land; which part being cold and springy, scarcely ever produced a crop; and, this morning, I have been to see the process of *underdraining* in this country. DRAINING.

Having from several years observation marked the springy parts, he began by circumscrib-

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2. DRAINING.

ing them with a drain, made as hereafter described, and then drew others within it in such directions as he knew from observation (not methodically) would convey the superfluous moisture from the wet parts to a main drain and outlet.

The drains were formed by two men, each of them having a tapering spade, and a hooked scoop. The first man took out a spit, with a square-pointed spade ten inches long, seven inches wide at the tread, and five inches at the point; and, to make a smooth footing for the next man to stand upon, drew out the crumbs with a five-inch scoop.

The other man sunk it about eight inches deeper with a round-pointed spade, eight inches long, five inches wide at the tread, and three inches near the point; clearing out the bottom with a narrow-mouthed scoop; namely, two inches and a half to three inches wide: the drain, when finished, being a foot to fourteen inches wide at the top; from eighteen to twenty inches deep; and about three inches wide at the bottom.

These drains were filled with oak and alder boughs in this manner:

The spray being stript off, the woody parts (from an inch and a half to three inches diameter)

meter) were laid in the bottom of the drain. If crooked, they had a chop given them in the elbow, and then preſſed down to the bottom with the foot. If large, one, if ſmall, two or three of theſe ſticks were laid at the bottom; upon theſe the ſpray, with the leaves on; and upon this a covering of heath. The whole, when trodden down, appeared to fill the drain within a few inches of the top.

2. DRAINING.

The mould was then laid on and ridged up over the drain.

A roller paſſed along and finiſhed the operation.

The land was immediately plowed for wheat.

The quantity of land drained is about three acres:

The expence about five pounds, or one pound thirteen ſhillings and four pence an acre, viz.

Opening and filling in 184 rods at 3d.	-	-	£2 6 0
Three loads of boughs (given him by his landlord) ſuppoſe	-	-	1 10 0
Two loads of heath 14s. carriage 10s.			1 4 0
			£5 0 0

2.
DRAINING.

He has repeatedly experienced this method of draining, and has found it anſwer his expectations. He is a cautious judicious huſbandman, and would not lay out 3*l.* 10*s.* without a moral certainty of gain.

3.

TURNEPS.

NOVEMBER 8. An experienced farmer in this neighbourhood ſays he has frequently found that ſteeping old turnep ſeed in water, and letting it lie a few hours in the ſun before ſowing, has brought it up much ſooner than ſowing it dry.

He adds, that this year, having neglected to ſteep it, he had turnep ſeed lay three weeks in the ground before it came up. He was adviſed to plow in the few ſtraggling plants which appeared ſoon after ſowing, under an idea that the fly had eaten off the remainder: but he judged from experience that the principal part of the ſeed was ſtill in the ground; he accordingly waited until rain fell, and has now, I ſee, a very fine crop of turneps.

This is a valuable incident; for it is highly probable, that in the beginning of the ſeaſon, when old ſeed is obliged to be ſown, many crops of turneps have been prevented by plowing the ground prematurely.

NOVEM-

4. 4.

EXCHANGE OF LANDS.

NOVEMBER 11. *A.* and *B.* having ſeveral ſmall pieces of land lying intermixed with each other's eſtates, agreed upon an exchange by arbitration.

The particular lands to be exchanged, and the general outline of the agreement having been previouſly determined upon; and each party having made choice of a referee; articles of agreement for exchange were ſigned.

The matters left to reference were theſe:

1ſt. The rental value of the reſpective lands in exchange.

2d. To determine which of the timber-trees growing on the premiſes ſhould be taken down by the then preſent owners (and removed off the premiſes before July next enſuing) and which ſhould be left ſtanding.

3d. The value of the timber, ſtands, pollards, and ſtubwood, which the arbitrators ſhould judge proper to be left ſtanding on the premiſes.

4th. A principal part of *B.*'s land lying at a diſtance from any of *A.*'s farms, except one which is let on a leaſe that has ſix years to run, during which time it remains at the option of the tenant whether or not he will

4. EXCHANGE OF LANDS.

rent theſe lands; it was agreed that each party ſhall, if required, hold his own land (or find a proper tenant) during the ſaid term of ſix years, at ſuch rent, and under ſuch covenants, as the arbitrators ſhould fix on.

On Monday the 6th inſtant, the arbitrators met; and having *previouſly* named an umpire, or third perſon, in caſe they ſhould diſagree in their award, entered upon the buſineſs; which was thus conducted.

Having firſt taken a curſory view of the ſeveral pieces to be exchanged; and having ſettled between themſelves the mode and rate of valuing the wood; they took the whole before them in this manner.

The arbitrators, both of them men of ſuperior abilities in the buſineſs they had undertaken, went firſt; pointing out which of the trees ſhould ſtand, and which be taken down: the latter were marked by chopping off a piece of the bark with an adze. The pollards and ſtubwood deemed fit to ſtand were valued and minuted by the arbitrators themſelves; and the timber-trees meaſured by two carpenters (one choſen by each party), an account being minuted by an aſſiſtant; by whom likewiſe the number of ſtands were taken.

The

4.
EXCHANGE OF LANDS.

The arbitrators, as they paſſed along, caſt their eyes upon the land, and ſeparately put their private valuations upon it.

The lands having been previouſly ſurveyed by two ſurveyors (one for each party), and the *rate* of valuation of the timber and other woods to be left ſtanding on the premiſes having been previouſly fixed upon by the referees, —it now remained to aſcertain the value of the ſeveral parcels of land; for which purpoſe a ſpecial meeting was appointed and held, yeſterday.

To ſimplify this important part of the buſineſs, and to render it as little liable to unneceſſary cavil as poſſible, it was agreed that the difference of rental value, whatever it might happen to be, ſhould be calculated at twenty-five years purchaſe.

The rental value of the reſpective pieces therefore now remained the almoſt only thing in ſuſpence. But in this they had differed widely in their valuations: in ſome pieces ſo much as four ſhillings an acre.

Argument having been tried without effect to reconcile the differences, it was propoſed by one of the referees to leave the matter to the umpire.

4. EXCHANGE OF LANDS.

Finding things in this ſtate, I ventured to propoſe a mode of ſettlement which appeared to me not only brief but equitable. This was, to lay aſide intirely the particularized eſtimates; and, after ſetting a part which was tythefree againſt a part of an inferiour quality, to exchange acre for acre.—It was agreed to by all parties.

There being a balance in the quantity of land under exchange of about four acres and a half, the buſineſs was now to fix a fair rental value upon this ſurplus. After ſome converſation it was fixed at fifteen ſhillings an acre.

RENT.

The rent of the land for the next ſix years was alſo fixed at the ſame rate; and the principal covenants entered into were, that the ſeveral pieces ſhould be left, as to crops, &c. in the ſame ſtate in which they now are.

Laſtly, the value of the wood to be left upon the premiſes being aſcertained by calculation, the buſineſs was ended.

The referees had put down in their eſtimates the *rent of the land* at twelve to ſixteen ſhillings an acre *.

* The quality of the lands in exchange are, conſidered collectively, ſomewhat above the par of lands in this District.

The

4.

TIMBER.

The *oak timber* they valued at eighteen pence, and the *aſh timber* at one ſhilling a foot, meaſuring all above ſix inches timber-girt*.

The *ſtands*, one with another, at a ſhilling apiece (leſs than ſix inches a ſtand, more than ſix a timber tree).

FIREWOOD.

The *pollards* principally from one to three ſhillings apiece—ſome few at four ſhilings.

The *ſtubwood* in proportion to the pollards.

5.

HEDGEROW TIMBER.

1781. MAY 8. It is imprudent to truſt, in any degree, to tenants, in the pruning of timber-trees.

This ſeaſon I took unuſual pains to inſtruct a young man, whoſe farm is unmercifully loaded with wood, in what manner he ſhould *ſet up* ſome trees which were particularly injurious to his crops (namely, to take off the ſmall boughs cloſe to the ſtem, and to leave live growing twigs upon the large ones, to draw the ſap, and thereby keep the ſtumps alive); nevertheleſs the havock committed on his farm is ſhameful.

It is true, he blames his men; but this is no excuſe: he promiſed to attend minutely to

* The timber in general coarſe.

the

5. HEDGEROW TIMBER.

the buſineſs himſelf. I pointed out the boughs which were proper to be taken off: but for one I pointed out, he has taken off three.

Nor is he the only one who has made the ſame wilful miſtake; and it is a want of common prudence to leave to a tenant a buſineſs of ſo much importance to an eſtate as the pruning of timber-trees; for he has a double intereſt in abuſing his truſt:—he diſencumbers his farm, and fills his wood-yard.

In future, when I ſee it neceſſary that timber-trees ſhould be lightened of their low-hanging boughs, whether for the preſervation of the hedge, or the relief of the crops, I will ſend a woodman to do it in a proper manner; and charge the faggots at a fair price to the farmer*.

6.

BURNING ANT-HILLS.

MAY 10. Some time ago, gave a tenant leave to cut and burn ant-hills off a dole belonging to his farm, upon a common.

* This rule I afterwards obſerved; and found it not only beneficial to the eſtate, but agreeable to the tenant; for under this regulation he found more of this neceſſary work take place upon his farm, than he had theretofore been able to get done.

His

His motive is the improvement of his farm by the aſhes; and his pretext the improvement of the common: both of which good purpoſes will probably be obtained. He is to level the ground, and rake in graſs-ſeeds. 6. MANURE.

His proceſs is to cut them up with a heart-ſhaped ſharp ſpade or ſhovel, in irregular lumps of ten to fifteen inches diameter, and two to five or ſix inches thick. Theſe are turned graſs-downward, until the mould-ſide be thoroughly dry, and then ſet up graſs-outward until they are dry enough to burn. GRASSLAND.

The fire is kindled with bruſh-wood, and kept ſmothering, by laying the ſods or lumps on gradually as the fire breaks out, until ten to fifteen or twenty loads of aſhes are raiſed in one heap. The workmen have agreed to complete the proceſs for a ſhilling each load of aſhes.

This is a cheap way of raiſing manure; beſides, at the ſame time, removing a nuiſance: and no man having ſuch an opportunity in his power ought to neglect making at leaſt an experiment. On ſome ſoils aſhes are found in themſelves an excellent manure; and, perhaps generally, aſhes raiſed in this way would be found highly advantageous as bottoming for farm-yards and dunghills.

JUNE

7. GRASSLAND

7.

June 28. The herbage of the dairy pastures (see GRASSLAND, vol. I. also MIN. 107.) consisting of ray grass, white clover, and a few of the taller grasses, having run up in patches to feed, I had it swept over with the sithe; partly to improve the feedage, which would soon have been much incumbered by the dry strawlike bents; and partly for the fodder, this year of scarcity of grass for hay.

Shut them up for a few days to freshen: gave one shilling an acre for mowing; and today have finished carrying fourteen jags (about nine or ten tons) of hay off forty-seven acres.

The hay is more than tolerable; for the pastures not having been too hard stocked, there was a fine bottom of white clover; which mixed with the fresh stalks of the blade grasses, likewise cut in the fulness of sap, and the whole made slowly in small cocks, the hay is green and sweet to a great degree; and will next winter no doubt be worth from fifty shillings to three pounds a ton.

Nine tons of hay at 55s.	£. 24	15	0
Mowing 47 acres £. 2 7			
Making and carrying, about - 2 7	4	14	0
Neat profit	£. 20	1	0

besides

beſides the ſightlineſs; the improvement of the feed; and the prevention of thiſtles and other weeds from ſeeding on the ground, and being blown about the neighbourhood. 7. GRASSLAND.

8.

JULY 10. Perhaps cattle and ſheep ſhould be kept ſeparate. STOCKING PASTURES.

While the dairy paſtures were ſwept (ſee laſt MIN.) the cows were ſhifted into a grazing ground; but, notwithſtanding there was a good bite, and the graſs apparently of a deſirable quality, they did not fill themſelves, nor milk ſo well as they did before they were put in, and after they were taken out; though their paſture afterwards was apparently of a worſe quality. But in the grazing ground were a flock of ſheep; whilſt the dairy paſtures had nothing in them except the cows and a few horſes. CATTLE. SHEEP.

Mr. Thomas Baldwin, of North Walſham, ſays, that having ſheepfolded a piece of ground, which, a drought ſetting in, he could not, as intended, break up; a good bite of graſs came up where the ſheepfold had ſtood. He put his cows in to feed it off: they would not touch it: he turned his horſes to it, and they eat it into the very ground.

JULY

9. 9.

FENCE-WALLS. JULY 21. Perhaps plant *ivy* againſt *ſeaſtone walls* to prevent their burſting.

Part of a wall before a cottage at Thorp is overgrown with ivy, part of it naked: the former is firm and upright—the latter burſt in many places; ſo as not to be made ſtrong again without a conſiderable part of it being taken down and rebuilt.

10.

MANURE. JULY 21. In December laſt, ſome ſhovellings of a ſheepfold were ſet experimentally

GRASSLAND. upon a piece of graſsland: this haytime I obſerve the ſwath there is nearly double to that in any other part of the piece.—The ſoil a good ſandy loam.

11.

SHEEPFOLD. JULY 29. Mr. Samuel Barber has, upon his Staninghall farm, a piece of olland* barley,

* *Olland*-barley; that is, barley ſown after *Olland*; a contraction of *old land*,—and is now applied univerſally to lays, or ſward, produced by CULTIVATED GRASSES.

a ſmall

a ſmall part of which was ſheepfolded once in a place; the reſt undreſſed. 12.

Where the fold ſtood the barley is, I apprehend, double the crop. The veſtiges of the fold are diſcriminable to an inch. The crop is thicker upon the ground, the ſtraw ſtronger and taller, and the ears fuller and much larger. There cannot be leſs than three coombs an acre gained to the firſt crop, by one night's ſheepfold; beſides an advantage to enſuing crops. The ſoil a light ſcorching loam. BARLEY.

12.

AUGUST 3. The turnep crops of this neighbourhood have ſuffered conſiderably this year from a ſpecies of caterpillars—provincially "black cankers"—which prey upon the plants after they are in rough leaf; eating them down to the ground; and totally deſtroying the crop wherever it happens to be attacked by theſe voracious reptiles. TURNEP CATERP.

It is obſervable, however, that the deſtruction is partial; many pieces being left untouched; and thoſe which are affected are only partially

12. TURNEP CATERP. partially eaten, in irregular plots; which perhaps are entirely eaten off, while the reſt of the piece remains uninjured.

It is ſtill more remarkable that the ſea-coaſt has ſuffered moſt; the miſchief decreaſing with the increaſed diſtance from the ſea. Perhaps the parent inſects were brought by the north-eaſt winds which have prevailed this year.

That inſects attempt, at leaſt, to croſs the ocean, ſeems evident from the obſervation of Mr. Arthur Bayfield, of Antingham, who ſays, that being on the ſeaſhore, ſome years ago, he ſaw myriads of flies, *reſembling* the cantharides, left dead upon the beach by the tide. Theſe, probably, being becalmed, or meeting with contrary winds in their paſſage, became ſpent, dropt into the ſea, and were drowned.

Mr. Thomas Shepherd, of Northreps, ſays, that this year a piece of early-ſown turneps was ſeen to be almoſt covered with a ſpecies of fly reſembling the grey horſe fly; with this difference, that the head is black and the body yellow. From former obſervations of this kind he foretold the deſtruction of that piece of turneps by the "cankers:"—and his apprehenſions were too well grounded; for it was totally

totally eaten up by them. What he adds is remarkable; he says that these flies were brought by a long-continued north-east wind, and that the wind getting round to the south, there was not, in a few hours, a single fly to be found in the piece. 12. TURNEP CATERP.

It is highly probable that these insects travel in flights, and that they are led about from place to place by the winds, or by other circumstances.

To prevent or check the devastation committed by the caterpillars, various devices have been practised by farmers whose crops were assailed by them. Some rolled with a heavy roller. Some sowed lime over the plants. Others employed ducks; and others women and children to pick them off the plants.

Mr. Arthur Bayfield found ducks the most efficacious; he collected seventy or eighty, and saved several acres of turneps through their means. He fed them twice a-day with corn, under an idea that "cankers," alone, would kill them.

Mr. William Barnard found handpicking answer his purpose. Five women and boys picked over ten or eleven acres of hoed plants in one week; about eighteen pence an acre.

12. TURNEP CATERP. Mr. James Carter, having one ſide of a cloſe entirely eaten up, and the other ſide, which had been ſown later, entirely free from caterpillars, dug a trench between the two parts, and put ſome lime in the bottom of it, by which artful expedient he ſaved his turneps: for the caterpillars, in attempting to croſs the trench in ſearch of freſh paſturage, fell among the lime, and were ſmothered. Mr. Bayfield ſays, that if the weather be dry, digging a trench without the lime will ſtop them: for the ſide of the trench being duſty they cannot crawl up, but roll back to the bottom; and by repeated attempts become exhauſted.

The farmers who hoed their plants while the caterpillars were upon them, and without uſing any precaution, inevitably loſt their crops, beſides loſing the expence of hoing; for after the operation the whole of the caterpillars fell of courſe upon the comparatively few plants which then remained, and preſently eat them down to the clods.

In this caſe, the only remedy is to plow up the ground and ſow afreſh; an expedient which has been obliged to be practiſed on, perhaps, ſome hundred acres of turnep ground this year.

About

About twenty years ago, it ſeems, the whole country was ſtripped by this means; the firſt ſowings being deſtroyed throughout the county. 13. TURNEP CATERP.

13.

AUGUST 3. It has long been conſidered as one of the firſt of vulgar errors among huſbandmen, that the berbery plant has a pernicious quality (or rather a myſterious power) of blighting the wheat which grows near it. BERBERY. WHEAT.

This idea, whether it be erroneous or founded on fact, is no where more ſtrongly rooted than among the Norfolk farmers; one of whom mentioning, with a ſerious countenance, an inſtance of this malady, I very faſhionably laughed at him. He, however, ſtood firm, and perſiſted in his being in the right;—intimating, that ſo far from being led from the cauſe to the effect, he was, in the reverſe, led from the effect to the cauſe: for obſerving a ſtripe of blaſted wheat acroſs his cloſe, he traced it back to the hedge, thinking there to have found the enemy; but being diſappointed, he croſſed the lane into a garden on the oppoſite ſide of it, where he found a large berbery buſh in the direction in which he had looked for it. The miſchief, according to his

13. BERBERY. deſcription, ſtretched away from this point acroſs the field of wheat, growing broader and fainter (like the tail of a comet) the farther it proceeded from its ſource. The effect was carried to a greater diſtance than he had ever obſerved it before; owing, as he believed, to an opening in the orchard behind it to the ſouth-weſt, forming a gut or channel for the wind.

Hearing him thus particular in his deſcription, and knowing him to be accurate in every circumſtance as to ſituation, I aſked him how he accounted for the miſchief. He anſwered to this effect: the berbery and wheat blow at the ſame time, and the duſt, or farina, of the berbery being blown over the wheat when in bloom, is poiſonous to it, and cauſes the blight.

This, I confeſs, ſtaggered my incredulity; for if the farina of vegetables be carried to a conſiderable diſtance, and at that diſtance have a quality of fructuoſity towards their own ſpecies;—and if ſome vegetables are ſalubrious, others poiſonous, to the animal creation, why may not the farina of one vegetable be carried to a conſiderable diſtance, and there become poiſonous to the fruitfulneſs of another of a diſſimilar genus *?

* This, however, is evidently not the cauſe; for I have ſince

13. BERBERY.

Being desirous of ascertaining the fact, be it what it may, I have enquired further among intelligent farmers concerning this subject.—They are, to a man, decided in their opinion as to the fact; which appears to have been so long established in the minds of principal farmers, that it is now difficult to ascertain it from observations; berbery plants having (of late years more particularly) been extirpated from farm-hedges with the utmost care and assiduity: one instance, however, of mischief, this year, I had related to me, and another I was myself eye-witness to. Mr. William Barnard, of Bradfield, says, that this year seeing a patch of his wheat very much blighted, he looked round for a berbery bush; but seeing none conspicuous in the hedge, which was thick, he with some difficulty got into it, and there found the enemy. He is clearly decided as to the fact. Mr. William Gibbs, of Rowton, telling me that a patch of his wheat was blighted in the same manner, and that he believed it to proceed from some sprigs of berbery which remained in the neighbouring hedge (which a few years ago was weeded from it) I went to

since observed, that the berbery blows several weeks before wheat shoots into ear.

13. BERBERY.

inſpect the place; and true it is, that near it we found three ſmall plants of berbery; one of which was particularly full of berries. The ſtraw of the wheat is black; and the grain, if it may be ſo called, a mere huſk of bran; while the reſt of the piece is of a much ſuperior quality.

Theſe circumſtances are undoubtedly ſtrong evidence; but do not by any means amount to proof.

14.

HARVESTING WHEAT.

August 9. Laſt night in riding from Norwich, I ſaw a farmer, at Hainford, *mowing* ſome wheat, which was dead ripe, and free from weeds. The gatherers immediately followed the ſithe, and the waggon the gatherers; ſo that it was harveſted at a trifling expence (at a time when all the corn in the country is ripe, and hands of courſe unuſually ſcarce) and was ſecured in the barn, without any riſque from the weather. This, at a pinch, may be worth imitation.

15.

HAY-CHAMBER FLOOR.

August 22. An excellent and cheap hay-chamber floor is made in this country with *clay* and rods.

Finiſhed

15.

HAY-CHAMBER FLOOR.

Finiſhed one today upon a farm at Suffield.

It meaſures ſix yards by eight, or forty-eight ſquare yards.

It took three hundred ſplints (alder and willow rods, about the thickneſs of a man's wriſt down to that of his thumb) at 1*s.* 6*d.* - - £. 0 4 6

Three loads of clay (caſting and carriage near) -	0	4	6
A waggon-body-full of ſtraw	0	2	0
Five days of a bricklayer and labourer, at 2*s.* 6*d.* -	0	12	6
One ditto to plaiſter it when it is dry on the under-ſide,	0	2	6
£.	1	6	0

or ſixpence halfpenny a yard ſquare.

N. B. The price, by meaſurement, for labour alone, is fourpence halfpenny a yard; which is a great deal too much.

This floor was made in the following manner:

The rods being trimmed (namely, the twigs and tops taken off), they were laid acroſs the joiſts as cloſe to each other as poſſible. If crooked they were "crippled" (had a chop in the crooked part with a hook or hatchet) ſo as to

15. HAY-CHAMBER FLOOR.

make them touch every joiſt, as well as each other. No nails or other confinement.

The clay being well ſoaked with water, the principal part of it was mixed with long wheat-ſtraw; which was well worked into it by the means of a horſe, or man, treading it, and by raking it about with a turnep hook; the reſt made mortar-wiſe, with a ſmall quantity of ſhort ſtraw.

The rods being bedded, and the clay prepared, the "dauber" laid a plank acroſs the rods to prevent his miſplacing them with his feet; and, ſtanding on this, laid on a thick coat of the ſtrawy clay, ſo as to cover the thickeſt of the ſplints about an inch thick, with a dung fork; working it well in between the crevices of the rods, and making it as level on the top as that rough tool would make it. This done, he went over it again with the mortar-clay, (ſtill ſtanding on his plank) and gave it a thin finiſhing coat, with a trowel. The thickneſs of the rods and the two coats of clay is about three inches:—the thinner they are the ſooner they dry, and the lighter they are for the joiſts and timbers.

Where, from the uncouthneſs of the rods, the clay forced through between them, the dauber with

with a hoe cut it off level with the rods on the under-ſide, and for this purpoſe drew his hoe over every part of it—a job preſently done.

15. HAY-CHAMBER FLOOR.

In the ſpring, when the floor is thoroughly dry, it is intended to be plaiſtered on the under-ſide, to cover the rods, and give it a parlourable appearance. This will take about a day's work.

A clay floor is preferable in two reſpects to a boarded one: it is cheaper and *tighter*.—Boards, except they be well ſeaſoned, and without they be plowed-and-tongued, and laid down at a greater expence than can be beſtowed on a farmer's hay chamber, will let the duſt and ſeeds through upon the horſes and harneſs; whereas clay renders it as tight as lead.

Mentioning my doubts to the workman as to its duration, obſerving that the rods, I was afraid, would ſoon rot;—he anſwered, that did not ſignify, for if the ſtraw be well worked into the clay, the floor will remain firm, though the rods be rotten.

Mr. John Baker, of Southreps, whoſe opinion in this caſe is deciſive, corroborates the idea of clay floors being preferable to boarded ones; and of their laſting a great number of years.

16. 16.

WELD. August 29. Laſt year, to try whether weld (*Reſeda luteola*—dyer's weed) be an object of the Norfolk culture, I ſowed one acre and three eighths with two pints of turnep ſeed, and two pints and a half of weld ſeed, the 16th of Auguſt.

The ſoil, a lightiſh ſandy loam, had been plowed three times as a fallow for wheat: gave a fourth plowing; harrowed;—ſowed the turnep-ſeed; harrowed;—ſowed the weld ſeed; re-harrowed, the horſes trotting.

It was hoed at a conſiderable expence with ſmall carrot hoes; it nevertheleſs got full of poppies and other weeds.

On one end of the piece, where the turneps were a bad crop, the weld was very good; but, upon the whole, only indifferent.

I am certain that in this experiment the turneps were extremely prejudicial to the weld; and there was no feed from them worth turning the ſheep to, until the plants began to run, in the ſpring; and then, in a few days, they ſtarted up, and drew the weld up with them, ſlender and ſickly. I am very clear in that, had the weld been ſown alone, and been twice hoed, the crop would have been much better, and the ſoil left cleaner.

I appre-

I apprehend there is no occaſion to leave the plants ſo thick upon the ground as is uſually done. I am perſuaded that ſix or eight inch hoes might be uſed with propriety in ſetting out the plants. If ſo, the expence of hoing would be little more than that of hoing turneps. 16. WELD.

I am of opinion, from this experiment, as well as from others that I find have been tried in the county, that weld may be raiſed with conſiderable profit in Norfolk; eſpecially at preſent (during the war), when weld is dear; but I am at the ſame time clearly of opinion, that it is not the intereſt of landlords to encourage the culture of it, without ſome rigid reſtrictions in their leaſes to prevent their tenants from carrying off their eſtates ſuch a quantity of vegetable matter, without replacing it with an equivalency of manure, agreeably to the uſual covenant relative to hay and ſtraw: for it is not the *corn* only, but the *ſtraw* likewiſe, that is carried off the premiſes in the ſhape of weld: perhaps to the amount of a ton or upwards an acre.

17.

AUGUST 29. Laſt autumn, in order to aſcertain the proper *time of putting ewes to the ram*, I made the following experiment: SHEEP.

The

17. SHEEP.

The 20th September put a ſcore of long-wooled ewes of different ages to a Leiceſterſhire ram, and a ſcore of Norfolk ewes to a Norfolk ram. Being in rather low condition, few of them took the ram till the beginning of October.

The 19th of October put twenty-three long-wooled and forty Norfolk ewes to the ſame rams, keeping the two breeds ſeparate.

The 20th of November put the ſame rams to a ſcore of each ſort reſerved for the purpoſe.

The early lambs were much the ſtouteſt and beſt for ſtores; and graſs lamb was out of ſeaſon before the late ones were fit for the knife.

But the crones* which took the ram early were not able to ſupport their lambs in winter: for graſs was ſcarce, and they could not break turneps.

Therefore, this year, all the young ewes have been put to the rams a week ago, and all the old ones are intended for the butcher before this year's graſs be gone: for in a country where turneps are the principal ſpring food, crones appear to be unprofitable ſtock.

* Crones—old ewes which have loſt their fore teeth.

18. 18.

MANURES for WHEAT.

AUGUST 29. Laſt autumn, made an accurate experiment on a large ſcale, with different manures for wheat, on a ſandy loam, ſummer fallowed.

Part of an eighteen acre piece was manured with fifteen or ſixteen loads of tolerably good farm-yard dung an acre; part with three chaldrons of lime an acre; the reſt folded upon with ſheep, twice; the firſt time at the rate of ſix hundred ſheep to a quarter of an acre (ſee MIN. 1.); the ſecond time thinner.

In winter and ſpring the dung kept the lead; and now, at harveſt, it has produced the greateſt burden of ſtraw.

The ſheepfold kept a ſteady pace from ſeedtime to harveſt, and is now evidently the beſt corned, and the cleaneſt crop.

The lime, in winter and ſpring, made a poor appearance, but after ſome ſhowers in ſummer it flouriſhed much, and is now a tolerable crop; not leſs, I apprehend, than three quarters an acre: and in this country, where dung is ſo ſingularly valuable for the turnep crop, it is a ſatisfaction to know that ſummer fallowing and lime alone will inſure a tolerable crop of wheat.

From

18. SHEEPFOLD.

From theſe data, the value of ſheepfold, *in this caſe*, may be calculated.

By MIN. 1. it appears that one hundred ſheep manured ſeven ſquare rods daily. But the ſecond folding was thinner; ſuppoſe nine rods, this is, on a par of the two foldings, eight rods a day each folding.

The dung could not be worth leſs than half a crown a load; and the carriage and ſpreading ten ſhillings an acre; together, fifty ſhillings an acre; which quantity of land the hundred ſheep teathed twice over in forty days.

Suppoſing them to be folded the year round, they would, at this rate, fold nine acres annually; which, at fifty ſhillings an acre, is twenty-two pounds ten ſhillings a hundred—or four ſhillings and ſixpence a head.

In ſome parts of the iſland the ſame quantity of dung would be worth five pounds an acre, which would raiſe the value of the teathe to nine ſhillings a head; which, at twopence a head a week, is more than the whole year's keep of the ſheep.

It does not follow, however, that all lands would have received equal benefit with the piece in conſideration; which, perhaps, had not been folded upon for many years; perhaps never

never before; and ſheepfold, like other manures, may become leſs efficacious the longer it is uſed on a given piece of land. 18. SHEEPFOLD.

19.

AUGUST 29. In the above-mentioned piece of wheat, I made a comparative *experiment* on the mode of ſowing. SOWING WHEAT.

Part was plowed-in, agreeably to the common practice of the Diſtrict, laying up the ſoil in narrow ridges: part ſown on the laſt plowing, and harrowed in: part put in with Mr. Duckett's drill-plow; which, from ſome practical knowledge of it, I had conſidered to be well adapted to the Norfolk ſoil.

The ſowings being made acroſs the manurings, the two experiments became diſtinct; and the reſults clear and deciſive. The time of ſowing the 31ſt of October.

The reſult of this experiment was not ſo ſtriking as that of the laſt. The part ſown over the furrow of the plow, and harrowed in, is however, very perceptibly, the worſt; but on comparing the part plowed in with the part drilled, no obvious difference is to be perceived. Had the drills been nine inches inſtead of twelve inches apart, I am of opinion they would have gained a preference; but, from this

19. this experiment, there does not appear to me to be any advantage to be expected from the drill worth changing the cuſtom of the country for.

SOWING WHEAT.

SEED PROCESS.

Laſt ſpring I made ſimilar experiments on the uſe of this implement with peas and barley.—During the ſummer the drills ſeemed to gain a preference; but, at harveſt, it is a moot point whether the drill or the common plow has the preference: and although theſe ſeveral experiments were ſeen and attended to by ſome good farmers of the neighbourhood, I do not find that any of them are ſo much ſtruck with the reſult as to be inclined to give up their preſent practice: nevertheleſs I am of opinion that this ingenious implement merits further trial. Barley appears to be the crop for which it is moſt eſpecially adapted in this country.

IMPLEMENT.

N. B. In November laſt, I attempted to try the ſix-rowed, or winter barley, againſt the common barley, as a winter crop; ſowing ſome of each ſort above; ſome under; and ſome in drills: but the pheaſants, rooks, hares, and other vermin, ſubverted the experiment, and nearly deſtroyed the crop: therefore, to ſave it from diſgrace, the ſcattered remains were plowed up in the ſpring, and the land ſown with common barley.

August

20. 20.

TURNEPS.

AUGUST 31. What a variety of enemies have turneps in this country! The "fly," the "canker," the "maggot" (at the root) and the "anbury," have this year already deſtroyed myriads.

The *fly* took them in their infant ſtate;—the *grub* and *caterpillar* whilſt their tops were yet ſmall; and, now, when their tops have almoſt got their full ſize, they are hourly dwindling with the *anbury*.

The *grub* in itſelf would not perhaps be fatal; but the rooks, in order to come at it, pull up not only the plants which are attacked, but thoſe alſo which are free from it; and by this means clear them as they go.

The *anbury* is a large excreſcence, which forms itſelf below the apple. It grows, it ſeems, to the ſize of both the hands; and, as ſoon as the hard weather ſets in, or it is, by its own nature, brought to maturity, it becomes putrid, and ſmells very offenſively.

At preſent, the ſtate of three ſpecimens which I have taken up, and examined attentively, is this:—The apples of the turneps are juſt forming (about the ſize of walnuts in the huſk) while the anburies are already as big as the egg of a

20. TURNEPS.

goose.—They are irregular and uncouth in their form, with inferior excrescences (resembling the races of ginger) hanging to them. On cutting them, their general appearance is that of a hard turnep; but on examining them through a magnifier, there are veins, or string-like vessels, dispersed among the pulp. The smell and taste somewhat resemble those of turneps; but without their mildness; having an austere and somewhat disagreeable flavor, resembling that of an old stringy turnep. The tops of those which are much affected turn yellow, and flag with the heat of the sun; so that, in the day-time, they are obviously distinguishable from those which are healthy.

It seems to be an idea among farmers, that the cause of the anbury is the soil's being tired of turneps; owing to their having been too often sown on the same land. This, however, is positively erroneous; for the piece from which I drew these specimens was an old orchard, and never before bore turneps in the memory of man.

Quære—Is it not caused by the above-mentioned or some other grub, that, wounding the vessels of the tap root, diverts the course of the sap; which, instead of forming the apple, forms this excrescence?

21. 21.

AUGUST 31. One ſide of an eighteen acre piece of turneps was folded upon; the reſt of the piece manured with dung. TURNEPS.

The part ſheepfolded eſcaped the devaſtation of the "fly" *obviouſly* better than the part dunged.— SHEEPFOL;

Quære—Were the flies increaſed by the dung, or were they trodden to death, or ſhut up and ſuffocated in their burrows, by the feet of the ſheep?

22.

SEPTEMBER 8. Mr. Thomas Drurey, of Erpingham, a man whoſe opinion is valuable in matters of huſbandry, ſays, that marl is a certain preventative of the *anbury*.—He is alſo of opinion with other judicious huſbandmen, that teathing the barley-ſtubble which is intended for turneps, will cauſe the anbury: his land, he ſays, although it be old-marled land, is, by avoiding the teathe, generally free from anburied turneps. TURNEPS.

23.

SEPTEMBER 12. Mr. William Barnard, of Bradfield, who was born (and reſided until DIBBLING WHEAT.

23. DIBBLING WHEAT.

about three years ago) at Great Ellingham, near Attleborough, gives the following account of the riſe and practice of the *dibbling of wheat.*

The dibbling of peas, he ſays, has been a cuſtom of that part of Norfolk time immemorial; but the practice has not been extended to wheat above eighteen or twenty years; nor has it been in any degree general for more than ten years.

The practice of dibbling wheat probably aroſe in this manner.—At Deepham, an adjoining pariſh to Ellingham, lived one James Stone, a labouring man, who was, in that neighbourhood, a noted dibbler of peas, and who cultivated for himſelf a few acres which he rented with his cottage.—He had three children who were as expert at "dropping" as the father was at "dabbing;" and having ſome acre or two of clover lay, which came in courſe for wheat, he conceived the idea of dibbling in the ſeed; probably thinking that he ſhould thereby keep his children from idleneſs, and ſave them, at the ſame time, an unexpected ſupply of bread.

He accordingly ſet about putting *his ſcheme* in execution, and preſently brought his neighbours

bours about him. Some of them ſmiled, and others laughed at his experiment; he nevertheleſs proceeded with his little corps, and finiſhed his patch. 23. DIBBLING WHEAT.

The land being in good condition, and the work being done in a maſterly manner, the plants came up ſo ſtrong and beautiful as to draw the eyes, not only of his fellow pariſhioners, but of the whole neighbourhood.

Mr. Barnard well recollects the circumſtance; for he paſſed the cloſe (which lay by the ſide of a public road) every day in his way to and from ſchool: and ſays, that he has frequently ſeen the neighbouring farmers, in their way to market, light at the gate, and go into the piece, to view the crop, which was now become popular.

At harveſt the crop proved extraordinarily good; and the dibbling of wheat has, from that time, been more or leſs practiſed in this circle of the county: the only one in which the practice is, even yet, become general among farmers.

Enquiring of Mr. B. the proportion which dibbled wheat in that country bears to the wheat ſown broadcaſt; he ſays, there is as much dibbled as there can be hands got to

23. DIBBLING WHEAT.

put it in; and apprehends that one half of the wheat about Wyndham and Attleborough is dibbled in; adding, that when wheat is dear the work-people are engaged ſome months beforehand; and frequently, when they are paid off for dibbling peas in March, they are engaged for the wheat ſeed-time.

Succeſſion. A clover lay once plowed is what is generally made uſe of for dibbling; it has however been tried, with a conſiderable ſhare of ſucceſs, on fallow ground.

Manure. The common practice is to ſpread the dung, or other manure, preſently before the ground be plowed. Some lay it on after the ſeed is in by way of top-dreſſing. But Mr. B. is of opinion, that ſetting on the manure in July, and letting it waſh into the ſoil before plowing, is the moſt eligible way of manuring for dibbled wheat.

Soil proceſs. If the ſoil be light and the weather dry, the plowman keeps pace with the dibblers:—the holes will not otherwiſe ſtand; the ſand running in and filling them up. The furrow—provincially "flags"—ſhould be cut about ten inches wide, and be turned over flat and even; and, to make them lay ſtill ſmoother and firmer, they are rolled pretty hard before dibbling.

The

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DIBBLING WHEAT.

The dibbles made uſe of in this operation are of iron. The acting part is an egg-ſhaped knob of iron or ſteel ſomewhat larger than a pigeon's egg. The ſmaller end forms the point of the dibble; and from the larger riſes a ſtring of iron, about half an inch ſquare, and two feet and a half long. The head of it is received into a croſs piece of wood (reſembling the crutch of a ſpade or ſhovel) which forms the handle.

The dibbler makes uſe of two of theſe tools; one in each hand; and, bending over them, walks backward upon the flags; making two rows of holes in each. The rows are uſually made about four inches apart, and the diſtance in the rows from two and a half to three inches; namely, four holes in each length of the foot of the dibbler.

The great art in making the holes lies in leaving them ſmooth and firm on the ſides; ſo that the looſe mould do not run in to fill them up before the ſeeds are depoſited. This is done by a circular motion of the hand and wriſt; which make a ſemi-revolution every ſtroke: the circular motion begins as the bit enters, and continues until it is clearly diſengaged from the mould. The dibbles muſt

23. DIBBLING WHEAT.

come out clean, and wear bright, or the operation is not perfect.

Another difficulty in dibbling is to make the holes at equal distances; more especially to keep the two rows straight and parallel with each other: for the dibbles being two distinct instruments, it requires some practice to guide them with precision; so as to pierce the flag in the exact point required. To remedy this, couples have been invented to keep the dibbles at a given distance; but this renders the implement complex, and prevents the learner from ever being able to use them singly. A man must be aukward indeed if he does not in a few days without this incumbrance make himself a tolerable master of dibbling.

A middling workman will make two motions, or four holes, in a second.

One dibbler employs three droppers; therefore one man and three children are called a set. Each dibbler takes three flags, which he performs upon by stages thus: He first takes an outside flag, and having gone some yards upon that, he returns; not upon the next flag, but upon the other outside flag of the three; and then finishes his stage by taking the middle one. This is done to keep his three droppers fully

fully employed, and at the ſame time to prevent his filling up the holes with his feet before the ſeeds are depoſited. Were he to carry but one flag with him, the droppers would have to paſs each other repeatedly, and have three times the ground to walk over; whereas by the above contrivance they are always uniformly progreſſive, and each child finiſhes its own flag. 23. DIBBLING WHEAT.

The droppers keep up with their dibbler, putting two or three grains of wheat in each hole (but of peas only one); the girls carry the ſeed in their aprons, the boys in their hats or other contrivance. Out of thoſe they take about half a handful, and deliver the ſeed into the holes through an aperture made between the firſt and ſecond fingers. Much time and patience is neceſſary to teach a child to perform this petty buſineſs with propriety and diſpatch.

The preſent price of dibbling a free light ſoil is nine ſhillings an acre and beer. It formerly was half a guinea. If the ſoil be ſtiff or ſtony, it is now worth more than that money. The dibbler is a ſort of maſter of his ſet; for if he has not children of his own, he hires his droppers, giving them ſixpence a day each if expert

25. DIBBLING WHEAT.

expert hands, or threepence a day if learners; two of them being employed on one flag, each taking one row of holes: so that he pays for dropping, threepence a day for each row of holes. An expert dibbler will "hole" half an acre a day, which at nine shillings is four and sixpence, out of which he pays one shilling and sixpence to his droppers: but one third of an acre is reckoned a fair day's work; which at nine shillings an acre is three shillings; out of which paying one shilling and sixpence, he has one shilling and sixpence left for his own day's work.

Quantity of seed. One bushel to six pecks an acre; and, if the flags crack much in plowing, some throw on half a peck or a peck an acre, broad-cast, before rolling.

Covering the seed. This is usually done by going twice in a place with a bush-harrow, made by drawing thorns into a gate or a large hurdle. Either of these however Mr. B. says, and with reason, makes too large an Implement; for in so large a space as this covers at once, there will be protuberances which it will lay hold of too much, and probably pull up, and hollows which it will wholly miss. He has usually preferred a waggon ladder, which does

not

not cover more than four or five flags at once; and to finiſh this buſineſs more completely, he always carries a ſort of broom in his own hand, when overlooking the work-people; in order to cover more effectually any part which may be partially miſſed. 23. DIBBLING WHEAT.

The advantages held out. There is a ſaving of about a buſhel and a half of ſeed; which, when wheat is ſix ſhillings or upwards, is alone an equivalent to the extra expence of dibbling.

The rolling and treading is eſteemed highly ſerviceable to the light lands of this country.

The edges of the flags being intimately united by the rolling and the trampling, and the remaining fiſſures being filled up by the harrow, the graſſes are thereby thought to be kept under; and ſhould ſeed weeds appear in the ſpring, the hoe has free admiſſion between double row and double row, to extirpate them; an operation, however, which I underſtand ſeldom takes place.

The ſeed being wholly buried in the body of the flag, there is no "under corn;" the plants are uniformly vigorous; the ſtraw, collectively, is conſequently ſtouter, and the grain more even, than that which is uſually produced from ſowing the ſeed broadcaſt over the rough flag.

For

23. DIBBLING WHEAT.

For in this caſe, part of the ſeed falls through between the flags, and being there too deeply buried by the harrows, the young plants are longer in reaching the ſurface than are thoſe from the ſeed which happens to fall in a more favourable ſituation; and which thereby gain an aſcendancy they never loſe: hence a number of underling plants, and hence the ſmall ſhrivelled grains, which render the ſample unſightly and unſaleable.

Another good effect remains to be noticed, the employment of the poor; and whether we view this in a moral, a political, or a private point of view, it is equally deſirable. For the poor's rates of a country village fall principally on the farmer; and if he does not employ the poor, he muſt ſupport them in idleneſs; more eſpecially children.—Mr. B. ſays, that in the circle above-mentioned wheat ſeed-time is conſidered, by the poor man, as a ſecond harveſt.

Mr. —— Smith, of Heavingham, gives a ſomewhat different account reſpecting the advantages of dibbling wheat. He ſays, that he has frequently had eight or ten acres of dibbled wheat in a year; that he has uſually made the holes as thick as they could ſtand, ſo as not to diſfigure or interfere with one another; and has dropped

dropped two bushels, at the expence of twelve or fourteen shillings an acre. 23. DIBBLING WHEAT.

He is clearly of opinion, that dibbling wheat makes the land foul; especially if it is not dibbled thick; and gives a very good reason for this opinion; namely, where corn is thin weeds will be thick. He is positive that the grass gets up more among wheat which is dibbled than among that which is sown broadcast over the rough flag of one plowing: adding, that after dibbled wheat he has usually been obliged to sow turneps the next year, instead of first taking a crop of barley; the common practice of this part of the country. He however acknowledges fully, that the straw of dibbled wheat is stouter, and the grain evener, and of a better quality, than that from wheat sown broadcast after any process whatever.

Mr. John Baker, of Southreps, spirited and judicious as he is in matters of husbandry, has never had a sufficiently good opinion of dibbling wheat to give it a trial; not even by way of experiment. His chief objection to it is, that in *this* country, where the soil is shallow, and the lays generally grassy, wheat cannot be sown in any manner with propriety on one plowing.

—— has

23. DIBBLING WHEAT.

——————— has tried it two or three different times: the firſt trial was on a piece of good land, with about three pecks of ſeed an acre: the crop good, and ſtood when moſt of the wheats in the county were lodged.—The laſt was on a light ſhallow ſoil: it proved greatly too thin: not half a crop.

From the ſum of this information the dibbling of wheat appears to be peculiarly adapted to rich deep ſoils; on which three or four pecks an acre dibbled early, may ſpread ſufficiently for a full crop: whereas light, weak, ſhallow ſoils, which have lain two or three years, and have become graſſy, require an additional quantity of ſeed, and conſequently an addition of labour, otherwiſe the plants are not able to reach each other; and the graſſes of courſe find their way up between them; by which means the crop is injured, and the ſoil rendered foul.

Dropping being the moſt difficult part of the buſineſs, it ſeems to be ineligible to begin with wheat; the grains of which being ſmall and irregular, are, to a learner, difficult and diſagreeable to ſeparate; whereas thoſe of peas, being larger round and ſlippery, are more agreeable to the touch, and more eaſily parted in the hand; ſo as to drop one or any other given number into each hole.

It

23.

DIBBLING WHEAT.

It further ſeems ineligible to ſend children into the field, in any caſe, until they have practiſed, at home, in the art of ſeparating the ſeeds; by which precaution a waſte of ſeed, and a diſfigurement at leaſt of the crop, may be prevented. For the ſame reaſon it ſeems proper, that a young dibbler ſhould be exerciſed on fallow or other freſh-plowed ground not intended to be dibbled, before he be admitted into the field of practice.

24.

SOWING CLOVER.

OCTOBER 10. Laſt year Mr. John Joy, of Northwalſham, having a piece of turnep ground which miſſed, he ſowed it with wheat; and, to keep his land in courſe, laid it down with clover, the ſeed of which he *ſowed in autumn*, preſently after ſowing the wheat.

I ſaw the ſeedling plants early in winter; when they looked remarkably healthy. Towards ſpring I ſaw them again; but ſome ſevere froſts had cut them entirely down, ſo as to make it doubtful whether they would recover or not.

I deſired Mr. Joy to acquaint me with the reſult; and yeſterday we walked over one of the fineſt ſets of clover that ever grew: not having

24. having been yet fed, the heads of the plants
SOWING CLOVER. now ſtand above the ſtubble; but for which a fine ſwath of clover-hay might be mown.

This is the firſt inſtance I have met with of ſowing clover ſeed over wheat in autumn.

25.

BUILDINGS. OCTOBER 10. Formerly, a ridiculous practice has prevailed in this country of running up the *peaks of gables* above the roof of the houſe. In many old houſes the coping of the gable ſtands eighteen inches, perhaps two feet above the thatch or tiling. The effect of it is, the water of driving rains is collected by this unneceſſary elevation of the wall, and either drains through between the gable and the roof, or, if an offset be made to prevent this, ſoaks into the wall itſelf.

An old-faſhioned "flue" rotted by this means, was the other day, upon this eſtate, thrown down by a guſt of wind.

I mention the circumſtance the rather, as this abſurd cuſtom is not yet altogether laid aſide; though the flues are now made much lower than formerly. In ſtrict propriety, the coping of the gable ought to be level with the covering.

For

25.

For common buildings, when the covering is of tile or ſlate; more eſpecially for a lean-to liable to the drip of the main roof; the beſt way is to continue the covering over the gable or end-wall; which is thereby effectually preſerved at an eaſy expence. BUILDINGS.

26.

October 18. This morning rode to Witton to ſee ſome labourers from the Attleborough ſide of the county dibble wheat. They had finiſhed. DIBBLING WHEAT.

Mr. Elmer ſhewed me what they had done for him:—the plants come up very ſtrong, and look healthy. The quantity of ſeed, ſix pecks an acre; dropping four or five grains in a hole.

Mr. E. mentioned one advantage which did not occur to me before: the feedage of the lays from July to October.

27.

October 25. On Wedneſday 17th inſtant went to the firſt day of the *Fair of St. Faith's*; a village near Norwich, where one of the largeſt fairs in the kingdom is held annually on that day for cheeſe, butter, and a variety of wares; but moſt eſpecially the firſt; which is brought in great quantities out of Suffolk to ſupply this MARKETS.

27. country during the winter months; when a
CHEESE. Norfolk cheese is not to be purchased in this part of the county.

CATTLE. The first day of this fair also draws together a good show of cattle; principally "home-breds;" either for store, or for fatting on turneps the ensuing winter: for which purpose, a show of Scotch bullocks are also exhibited upon a rising ground at a small distance from the Fair-field.

The sale of Scotch cattle continues for a fortnight, or longer time, until this quarter of the county be supplied with that species of stock. (See BULLOCKS, Vol. I.)

Yesterday, attended the bullock fair.

FATTING CATTLE. There are fewer cattle this year than has been known for some years past (about four hundred upon the Hill yesterday), owing chiefly to a great many having been killed by contract for the Navy; a thing not practised before in Scotland; and there were yesterday a greater number of buyers in the market than usual (about fifty of the principal farmers in the county); so that the Scotchmen had the game in their own hands.

The principal drovers are Tate, Wigglesworth (Lord Galloway's steward), Moffatt, Campbell, Stewart.

It

27.
FAIR OF ST. FAITH'S.

It is aſtoniſhing to ſee the ſtate and condition of the cattle: they look as freſh and as ſleek as if they had not travelled a mile from home: ſome of them tolerable beef. Even ſo high as eleven pounds a piece was aſked for ſome bullocks; it was however to chooſe four out of a large drove; but ten pounds was aſked to draw fifteen or twenty.

Mr. John Baker bought ſix ſpayed heifers, which he drew out of a lot of thirty, at 7*l.* 15*s.* a head; and another neighbour drew twenty-one of the remainder of the lot at 7*l.* a piece: he afterwards bought ſeven of an inferior quality at 6*l.*

There were half a ſcore in the fair ſo low as 4*l.* but the price in general ran from 6*l.* to 9*l.* a head, for cattle which will fat to from forty to ſixty ſtone; but high as theſe prices are, Mr. Tate (the oldeſt drover) ſays, he has known them, ſome years ago, twenty or thirty ſhillings a head dearer than they are, even this year.

Each drover hires meadows or grazing-grounds in proportion to his quantity of cattle; —the farmers in the neighbourhood preſerving for the purpoſe a full bite of graſs; for which the Scotchmen pay very amply. The charges on ſale muſt run high. The number of at-

27.
FAIR OF ST. FAITH'S.

tendants, the high price of grafs, and treating the farmers, "to the amount perhaps of a couple of guineas a day," muft lower the neat proceeds very conſiderably, even of each bullock taken ſeparately *.

The drovers do not bring their whole ſtock upon the "Bullock Hill" at once; but let them remain in the paſtures until they are wanted; nor do they bring very large droves at once into the country; but keep them back in Lincolnſhire, or perhaps in Scotland, until they ſee how the demand is likely to prove.

I did not learn the annual demand, on a par of years; but was told that Tate alone brings ſome thouſands, every year, into this country.

The larger bullocks are principally of the Galloway polled breed, and moſt of them very handſome; in general, four or five years old; moſtly black, ſome brindled, ſome dun, and ſome few red. (See article BULLOCKS, Vol. I.)

28.

DIBBLING WHEAT.

OCTOBER 27. This morning rode again to Witton to ſee ſome work-people dibble wheat; and fortunately found them at work.

* The charges of drift from Scotland to Norfolk are, I have been told, from five ſhillings to fifteen ſhillings a head, according to the ſize of the bullock.

One

28.
DIBBLING WHEAT.

One man and one young woman dibbled, while three women and three girls dropped.

They proceeded thus: the man carried three flags, the women two. The man was followed by one woman, taking the firſt flag, and three girls taking among them the remaining two. The woman was followed by the other two women, each of them taking one flag. When the weather holds fair, the ſet do about three quarters of an acre a day, at ten ſhillings and ſixpence an acre.

The man, the woman dibbler, and the two women "head droppers," come from the Suffolk ſide of the county: the other woman and the girls are of this country; this being their firſt ſeaſon. One of them drops very badly; ſometimes putting ſix or ſeven "kernels" in a hole; beſides ſcattering a great many upon the ſurface. This ſhews the impropriety of ſuffering children to come untutored into the field. The head droppers do it very quick and very neatly; dropping two, three or four kernels in each hole; and about five pecks an acre.

The diſtance of the holes, and the method of dibbling and dropping (except the arrangement of the droppers), exactly the ſame as de-

28. DIBBLING WHEAT.

ſcribed by Mr. Barnard; whoſe account is, I am now fully convinced, a very faithful one.

The ſeed was brined and limed.

The droppers carried their ſeeds in boys hats ſewed up about half way acroſs, leaving an opening ſufficient for the hand, with a ſtring by way of a bow or handle. A buſhel, with the ſeed in it, ſtood in the middle of the cloſe; out of this they repleniſhed their hats, every time they paſſed it.

The ſoil lightiſh loam (too light I am afraid to be dibbled with wheat), but had been marled laſt year. It is a ſecond year's lay, and was paſtured this ſummer.

It is plowed fleet, and very badly, the flags being much broken, and very uneven: were it plowed a little deeper, which I apprehend it might be with ſafety, the flags would not break ſo much, and there would be a better bed for the ſeed. The dibblers are obliged to keep a light hand, and make their holes ſhallow, leſt otherwiſe they ſhould ſtrike their dibbles quite through the flags.

The flags are rolled before and "buſhed" after dibbling; the latter with a harrow made of a ſtrong large hurdle, covering better than half a rod at once.

The

The plow and roller keep time with the dibbles; for if much rain fall upon the flags they daub, and are difficult to dibble; if the weather prove dry, the ſand runs in, and fills up the holes as faſt as they are made. 28. DIBBLING WHEAT.

29.

OCTOBER 28. In May laſt, I made an experiment with *lime for turneps*, by ſpreading a chaldron of lime (at the rate of three chaldrons an acre) acroſs each of two pieces of turnep fallow, and marked the ſtripes with ſtumps. MANURE. TURNEPS.

No apparent benefit aroſe from the lime, until the late heavy rains fell; ſince which the plants have flouriſhed, and the good effect of the lime is become evident.

In March laſt I alſo made a ſimilar experiment with *lime for barley*; but the crop did not, in any ſtage, receive apparent benefit from it. The ſummer, until after the barley had finiſhed its growth, was dry. BARLEY.

In the experiment with *lime for wheat* (ſee MIN. 18.) the crop received no apparent benefit from the lime until the ſoil had been moiſtened with *ſummer* rains. WHEAT.

From theſe and other obſervations I am of opinion, that lime does not act as a manure LIME.

29. LIME. until it has been thoroughly ſlaked in the ſoil; and, from the laſt mentioned incident, it ſeems as if the rains of *ſummer* were neceſſary to promote its operation.

30.

FURZE-FOOD. NOVEMBER 6. In a furze ground, in which a large plot was cut down laſt winter, there is now a crop of young ſhoots from two to two and a half feet high: if theſe were now mown (which if the ſtubs be cut tolerably level they might be with great eaſe), there would be I apprehend two load of tender ſucculent herbage an acre.

If furze tops be that hearty and wholeſome food they are repreſented to be, how eaſily and with what advantage they might be in this manner collected: Cut the ſtubs low and level; mow; and bruiſe the herbage with a broad wooden wheel in the cyder-mill manner.

Lands which will afford no other crop will produce furze; and although poor lands would not throw up ſhoots like thoſe alluded to, the crop might, no doubt, be mown, and the ſhoots, if very ſhort, be collected in a receptacle at the heel of the ſithe.

I men-

I mention this incident, and communicate my reflections upon it, the rather, as I have not met, either in theory or practice, with the idea of collecting furze-food with the ſithe; the only thing wanted, perhaps, to bring it into common uſe. 30. FURZE-FOOD.

31.

NOVEMBER 10. The *Bullock Hill* at St. Faith's is ſaid to receive no benefit from the *teathe* of the bullocks, which every year are ſhewn upon it daily, during a fortnight or three weeks. MANURE.

This year it was wheat; and if one may judge from the ſtubble (notwithſtanding the wheat was dunged for), the crop was a very indifferent one.—The ſoil a lightiſh ſandy loam.

This is an intereſting fact. It is ſaid to be owing to the worthleſſneſs of the teathe of "drove bullocks." This I much doubt, however; for the bullocks being many of them in high caſe, and kept in grazing-grounds about St. Faith's, ſome of them perhaps within a quarter of a mile of the Hill, the driving is little more than the driving of ſheep to a fold. Some of them may, no doubt, come onto the Hill immediately from Scotland; and they are all of them of courſe driven more or leſs; and there may be *ſome* truth in this opinion.

That

31. That the teathe of lean ſtock, and more par-
FAIRSTEAD TEATHE. ticularly of cows, is much inferior to that of fatting bullocks, is a fact univerſally acknowledged throughout this county; and this may in ſome meaſure be accounted for from the oleaginous matter carried off by the milk of cows, and imbibed by the vaſcular carcaſes of lean ſtock in general. On the ſame principle, if ſtock be hard driven, and much exhauſted by perſpiration, and want of regular nouriſhment, their teathe may become inſipid and of little uſe to land; conſequently this reaſoning may in part be applicable to the Bullock Hill at St. Faith's: but, as before has been obſerved, there are numbers that come in good condition, and from good paſtures, at a very ſmall diſtance from the Fair-hill, and there is no obvious reaſon why the teathe of thoſe ſhould not be nearly equal to that of other fatting cattle: therefore, upon the whole, it ſeems probable that driving alone does not produce this intereſting fact.

MANURE. May we not venture to think it poſſible, that land may be ſatiated, or tired, even of the dung of cattle? The Hill in queſtion has been the ſite of a large fair for cattle, during time immemorial: perhaps, were the fair removed and the ſoil manured with lime, marl, or ſuch other

new

new manure as experience would point out, it might continue to throw out great crops for many years. 31. MANURE.

This is a ſubject worth inveſtigating; for upon old grazing-grounds, which have been fed and teathed with cattle during a length of time, the dung which falls from them cannot, on this hypotheſis, be of any uſe to the land; conſequently the ſtock may, without injury to the paſture, be driven off in the night-time to teathe ſome arable land; or the dung may, with advantage, be collected and carried off; whilſt by mould, aſhes, ſoot, &c. the graſs-land may receive improvement. GRASSLAND.

32.

NOVEMBER 17. To-day, compleated the "roofing" of a reeded barn. THATCHING WITH REED.

I have attended particularly to the method of laying the reed, and of ſetting on the "roofing" of this building.

The method of laying reed is this:

No laths being made uſe of, a little of the longeſt and ſtouteſt of the reed is ſcattered irregularly acroſs the naked ſpars, as a foundation to lay the main coat upon: this partial gauze-like covering is called the "fleaking."

On

32. LAYING REED.

On this fleaking the main covering is laid, and fastened down to the spars by means of long rods—provincially, "sways"—laid across the middle of the reed, and tied to the spars with rope yarn; or with "bramble bonds;" which, formerly, were much in use; but which are now pretty nearly laid aside, especially for new roofs.

Reed is not laid on in longitudinal courses, in the manner that straw thatch is usually put on, nor is the whole eaves set at once. The workman begins at the lower corner of the roof, on his right hand for instance, and keeps an irregular diagonal line, or face, until he reach the upper corner to his left.

A narrow eaves-board being nailed across the feet of the spars, and some fleaking scattered on, the thatcher begins to "set his eaves," by laying a coat of reed, eight or ten inches thick, with the heads resting upon the fleaking, and the butts upon the eaves-board. He then lays on his sway (a rod about the size of a small edder) about six or eight inches from the lower points of the reed; whilst his assistant, on the inside, runs a needle, threaded with rope yarn, close to the spar; and, in this case, close to the upper edge of the eaves-board. The thatcher

thatcher draws it through on one ſide of the ſway, and enters it again on the contrary ſide, both of the ſway and of the ſpar: the aſſiſtant draws it through; unthreads it; and, with the two ends of the yarn, makes a knot round the ſpar; thereby drawing the ſway, and conſequently the reed, tight down to the roof: whilſt the thatcher above, beating the ſway and preſſing it down, aſſiſts in making the work the firmer. The aſſiſtant having made good the knot below, he proceeds with another length of thread to the next ſpar; and ſo on till the ſway be bound down the whole length; namely, eight or ten feet. 32. LAYING REED.

Another ſtratum of reed is now laid on, upon the firſt, ſo as to make the entire coat eighteen or twenty inches thick at the butts; and another ſway laid along, and bound down, about twelve inches above the firſt.

The eaves being thus completely ſet, they are adjuſted and formed; not ſquare with the ſpars, but nearly horizontal: nor are they formed by cutting; but by "driving" them with a "legget;" a tool made of a board eight or nine inches ſquare, with a handle two feet long, fixed upon the back of it, obliquely, in the manner of the tool uſed by gardeners in beating

32. LAYING REED.

beating turf. The face of the legget is set with large-headed nalls to render it rough, and make it lay hold of the butts of the reed.

Another layer of reed is laid on, and bound down by another sway, somewhat shorter than the last; and placed eighteen or twenty inches above it; and above this another and another, continuing to shorten the sways until they be brought off to nothing, and a triangular corner of thatching formed.

After this, the sways are used their whole length, whatever it happens to be, until the workman arrives at the finishing corner.

By proceeding in this irregular manner seams between the courses are prevented; and unnecessary shifting of ladders avoided.

The face of the roof is formed and adjusted, like the eaves, by driving the reed with the legget; which operation, if performed by a good workman, not only gives the roof a beautiful polished surface, but at the same time fastens the reed; which, being thickest towards the butts, becomes, like a tapering pin, the tighter the farther it is driven.

Reed running from four to six or eight feet long, the heads meet at the ridge of the roof, whilst the butts are still at a distance from each other.

other. For this reaſon, as well as for that of the wear being leſs toward the ridge, the ſhorteſt (which is generally the worſt) reed is ſaved for the upper part of the roof. But even ſuppoſing the uppermoſt courſes to be only four feet long, and that the heads (belonging to the two ſides) be interwoven in ſome degree with each other, the butts will ſtill remain ſix or ſeven feet aſunder; and the ridge of the roof conſequently be left in a great meaſure expoſed to the weather.

32. LAYING REED.

To remedy this inconveniency, and to give a finiſh to the ridge, a cap—provincially, a "roof"—of ſtraw is ſet on in a maſterly, but in an expenſive manner. SETTING ON ROOFLETS.

In this operation, the workman begins by bringing the roof to an angle, with ſtraw laid long-way upon the ridge, in the manner in which a rick is topt up; and to render it firm, to keep it in its place, and to prevent the wind from blowing it off, or ruffling it, he pegs it down ſlightly with "double broaches;" namely, cleft twigs, two feet long, and as thick as the finger, ſharpened at both ends, bent double; perhaps with a twiſt in the crown; and perhaps barbed, by partial chops on the ſides, to make them hold in the better.

This

32.
SETTING ON ROUFLETS.

This done, the workman lays a coat of ſtraight ſtraw, ſix or eight inches thick, acroſs the ridge; beginning, on either ſide, at the uppermoſt butts of the reed, and finiſhing with ſtraight handfuls laid evenly acroſs the top of the ridge.

Having laid a length of about four feet in this manner, he proceeds to faſten it firmly down, ſo as to render it proof againſt wind and rain. This is done by laying a "broachen ligger" (a quarter-cleft rod as thick as the finger, and four feet in length) along the middle of the ridge, pegging it down at every four inches with a double broach, which is firſt thruſt down with the hands, and afterwards driven with the legget, or with a mallet uſed for this purpoſe. The middle ligger being firmly laid, the thatcher ſmooths down the ſtraw with a rake and his hands, about eight or nine inches on one ſide, and, at ſix inches from the firſt, lays another ligger, and pegs it down with a ſimilar number of double broaches: thus proceeding to ſmooth the ſtraw, and to faſten on liggers at every ſix inches, until he reach the bottom of the cap. One ſide finiſhed, the other is treated in the ſame manner; and the firſt length being completed, another and another length is laid, and finiſhed as the firſt;

first; until the other end of the ridge be reached. 32. SETTING ON ROOFLETS.

He then cuts off the tails of the straw, square and neatly with a pair of shears, level with the uppermost butts of the reed; above which the cap (or most properly the ROOFLET) shews an eaves, of about six inches thick.

Lastly, he sweeps the sides of the main roof with a bough of holly; and the work is completed.—(For the expence, see BUILDINGS and REPAIRS, Vol. I.)

33.

NOVEMBER 17. A very secure way of *laying pan-tiles* is sometimes practised in this country. BUILDINGS.

Having nailed on the pantile laths, the tiler distributes reeds, so as just to touch each other, between the pantile-laths; and, to keep them in their place, inserts one end of a piece of old plastering lath, or other splinter, under the tyling lath; presses it down upon the reed; and inserts the other end under the next lath; weaving, as it were, these splinters between the pantile laths and the reed.

Upon the reed he spreads a coat of mortar, and on this lays the tiles.

For dairy or other leanto's, and for common garrets, the reed is covered on the inside with

33.
LAYING PAN-TILES.

a coat of plaſtering; which, with the ſpars, &c. being white-waſhed, gives a neat appearance at a very trifling expence; and keeps the room as free from duſt as if it were lathed and ceiled.

This is not a common practice; but it is a very good one; and is much cheaper than the ordinary practice of "interlathing" with plaſtering laths.

34.

HEDGES.

NOVEMBER 19. It is not the earlieſt-done hedging which makes the ſtrongeſt ſhoots from the ſtubs. A piece of hedging was done on the lands late Mr. ——'s in the month of April. The face of the ditch ſtands remarkably well; and the ſhoots of hawthorn, cut down cloſe to the face, are uncommonly numerous, and large; ſome of them being near five feet high.

Perhaps there is an advantage in cutting thorns at that time of the year. When they have been cut off in winter, the ſpring air has no ſurface to act upon; except the ſtump, which barely ſhews its head above ground: whereas thoſe which ſtand till the ſap begins to ſtir, have, by their quantity of ſurface, rouſed the

the ſap in the root, without having yet exhauſted any of it; conſequently when the top is taken off, the ſtub throws out many and ſtrong ſhoots.

34. TIME OF CUTTING HEDGE-WOOD.

Therefore, if this reaſoning be good, there is a judicious moment for cutting hedges and underwoods: namely, when the ſap has begun to riſe, but before any part of it has been exhauſted: and perhaps this time is when the tree or ſhrub is beginning to bud: the young quick againſt Suffield Common was cut in this ſtate, and the ſhoots are remarkably ſtrong *.

35.

BUILDING.

November 23. Having frequently ſeen the miſchiefs done to the leanto porches of barns; by loads of corn being drawn furiouſly againſt them in harveſt; I have long wiſhed to try ſome method of prevention.

CHECKBEAM

In building a new barn at Antingham, I threw the ends of an old beam into the jambs of the ſide-walls; ſo as to reach acroſs the floor, at the entrance of the porch; low enough

* There is, however, a diſadvantage in cutting thorns intended for hedging materials in this ſtate; as they are leſs durable than when they are cut in winter, when the ſap is down.

35. CHECKBEAM

to take the top of the load, and high enough to be out of the way of the flail; ſetting a man with his flail to give the workmen the proper height.

I find, however, that either the thraſher, or the bricklayer has made a miſtake; for yeſterday the thraſher told me, that he frequently hits his flail againſt the beam.

The height from the floor, I find, is nine feet; ſix inches more, he ſays, would be high enough; however, he being a middle-ſized man, a foot may be neceſſary: and ten feet may perhaps be taken as a general height.

The miſchief is uſually done by large loads; to draw in which (eſpecially if the barn floor lies much higher than the yard) the horſes are obliged to exert their utmoſt ſtrength; but the load being once landed upon the floor, no farther exertion is neceſſary; nevertheleſs the horſes being rouſed and ſpirited, or not under command, ruſh furiouſly on till they come to a check; which is generally the roof of the porch. A ſmall load requires no extraordinary exertion, but is drawn in deliberately, and the horſes of courſe are ſtopped at pleaſure. The height of a pair of full-ſized barn-doors is fourteen feet, and a high load will nearly touch the plate. Twelve feet high is but a ſmall load. Therefore,

fore, in every reſpect, ten feet high is a proper height for a CHECK-BEAM. 35. CHECKBEAM

36.

NOVEMBER 25. Oaks are obſerved to grow beſt, and make the fineſt plants and the moſt beautiful trees, when they are raiſed undiſturbed from the acorn. The oak having naturally a ſtrong tap root, it is almoſt certain death to remove a large plant, which has not been tranſplanted, or tapped, whilſt young: nevertheleſs if the tap root has been properly taken off from the ſeedling plant, it may afterwards be removed at pleaſure with ſafety. PLANTING.

Oaks may be tapped by taking up the plants and taking off the tap root with a knife, or they may be tapped as they ſtand, with a tapping iron, or even a common ſpade ground to an edge. This, being introduced at a proper depth beneath the ſurface of the ground, cuts off the tap root; leaving the principal part of the lateral horizontal fibres undiſturbed.—When the plants have got large (four or five years old for inſtance), this is perhaps the ſafeſt way of treating them; for the lateral ſhoots, in this caſe, receive no check whatever, but continue to throw up a regular ſupply of ſap to the

36. plant; whereas by taking them up, and remov-
TAPPING OAKLINGS. ing them into a freſh ſituation, they are ſeveral days before they begin to work; in which time the plant may receive irrecoverable injury.

A ſeed-bed of oaklings, five years old, I treated in this manner. In March-April, tapped them all with common ſpades, ground ſharp; pruned ſuch as were in any degree ſtraight; and headed down the reſt near the ground, to throw out ſtraight ſhoots to be trained.

Not a plant I ſee is dead.

Had there been more of them cut down, the effect would have been ſtill better.

37.

PLANTING. NOVEMBER 25. A ſtriking inſtance of ſucceſs in *tranſplanting large oaks* for ſtandards occurs on Gunton Common. Scarcely a plant, of ſome thouſands, has miſcarried, and very few which do not flouriſh.

A perſon, who had ſome ſhare in the buſineſs of this plantation, tells me, that it was the employment of two men and a couple of horſes, almoſt all the firſt ſummer after they were planted, to water them; not by a pailfull, but by a hogſhead, at once; which ſerved for the ſummer.

This

This was a rational method; a pailfull only tantalizes and balks the plant; whereas a hogſhead depoſited at its root affords a natural and regular ſupply, to be drawn up leiſurely by the ſun, during the courſe of the ſummer. 37. PLANTING.

38.

NOVEMBER 25. The aſh delights in a moiſt ſituation, and will thrive even in an undrained moory ſoil. How healthy and luxuriant are thoſe on Gunton Common, which grow upon a low moory ſwampy part; almoſt upon a level with the water: and even thoſe on the ozier-beds vie with the aquatics. THE ASH.

The aſh is a thirſty plant. The road under an aſh is obſerved to be always comparatively dry; and it is probably from this abſorbent nature, that it is ſo great an enemy to the herbaceous tribe. Turneps, a ſucculent plant, ſtarves under the aſh; and corn never thrives in its neighbourhood.—Clover, however, *ſeems* to be an exception to this theory.

It is, nevertheleſs, an undoubted fact, that the aſh is a deſtructive enemy on arable land; and it is highly improper to plant it in hedges. It ought to be planted in waſte nooks and corners; or perhaps, for two reaſons, on unim-

38.

THE ASH. provable ſwamps, and on the ſpringy ſides of hills: it would be rendering them uſeful as ſites of plantations; and, perhaps, by its abſorbent nature, would render them firm.

THE ALDER. The alder, on the contrary, is obſerved to make the ground it grows on ſtill more rotten and boggy: it ought therefore, for two reaſons, never to be planted; namely, the injury to the land, and its own worthleſſneſs.

39.

MARKETS. NOVEMBER 26. This morning took a ride to ſee *Holt Fair*.

This is a fair for "homebreds," or Norfolk ſtock only; no Scotch drovers frequenting it.

A neighbour bought nine three-year-olds (coming) five of them ſteers, four ſpayed heifers, forward in fleſh, at 4*l.* 7*s.* 6*d.* a piece.

A farmer in the neighbourhood bought two of the ſame age, but lean, though larger, and not out of condition, for 7*l.*

Some kind-growing two-year-olds (coming) were aſked fifty-five ſhillings a piece for.

Cows and calves ſell very low in Norfolk. They were ſold today from about fifty-five ſhillings to three pounds ten ſhillings a couple.

It is alſo obſervable, that lean ſtock—"ſtraw-racks"—ſell very low in this country, at this time

time of the year; while ſuch as are forward enough to be finiſhed with turneps, or with the addition of a little ſpring graſs, ſo as to be got early to market, fetch aſtoniſhing prices.—Witneſs the forward cattle today, and the bullocks at St. Faith's. 39. HOLT FAIR.

The reaſon is this:—A farmer has ſo many more acres of turneps than he wants for his preſent ſtock;—he muſt therefore either run the riſque of ſelling his turneps, or buy ſtock which he can finiſh in the ſpring, otherwiſe he will be overſtocked the next year.

It is obſervable that the heifers (of the nine abovementioned) are forwarder than the ſteers; inſomuch that the purchaſer hopes to finiſh them with turneps; but the ſteers, he expects, will require ſome graſs at the ſpring of the year. CATTLE.

It was an obſervation made, and agreed to, that the grazing grounds, about Foulſham, (where theſe came from) fatten heifers faſter than they do ſteers. In corroboration, a byſtander ſaid, that he this year ſent a parcel of young ſtock to theſe grounds; the heifers came home almoſt meat, the ſteers little better than when they went. GRASSLAND.

This, if a fact, is highly intereſting.

NOVEMBER

40. 40.

FATTING CATTLE.

NOVEMBER 28. How profitable are the little *Isle-of-Sky Cattle* to the Norfolk farmer, who has rough meadows for them to run in?

——— had eleven bought laſt Hempton-green fair (juſt twelve months ago) for three guineas a piece. They were kept entirely on ſtraw and ruſhy graſs, which nothing elſe would have eaten, until the month of May; when they were turned into ſome Norfolk meadows, (worth about ten ſhillings an acre) where they remained until September: ſince when they have been at good lattermath. They are now ſome of them quite fat, and the reſt nearly ſo; one with another, they are worth about ſix pounds a piece.

Suppoſing each occupied an acre of meadow, which (with town charges) reckon at 0 12 0
Straw over and above the dung 0 5 0
Ten weeks lattermath, at two ſhillings (the price for ſuch cattle) 1 0 0

£1 17 0

A neighbouring farmer bought a parcel at the ſame time, and at the ſame price; alſo ſome refuſe ones ſo low as five-and-twenty ſhillings

ſhillings a piece; two of which he ſold a few days ago for eleven pounds four ſhillings. 40. FATTING CATTLE.

Theſe, however, were followers at turneps the firſt winter. In ſummer they were ſent to a grazing ground: ſince harveſt they have been in the ſtubble and "rowens," at good keep.

His other bullocks had nothing but ſtraw in winter; were ſhifted about in the meadows during ſummer; ſince harveſt they have been in the ſtubbles; and are now at turneps.—They have grown much, and are now getting on very faſt.

It is obſervable, however, that all theſe cattle were bought in very cheap.

41.

DECEMBER 1. A prudent farmer, in this Diſtrict, makes a very proper diſtinction between laying up "wheat-riggs" where there are pheaſants, and where there are none. A part of his farm, tolerably free from game, he lays up in ſix-furrow work; but towards the covers, in wide flat beds; having found by experience that pheaſants always begin to ſcrape on the ſides of the furrows, where they can eaſily come at the grain; the mould being there looſe, and eaſily falls back into the furrows: therefore, WHEAT. GAME.

41.
PLOWING for PHEASANTS.

therefore the fewer inter-furrows the leſs miſchief they are capable of doing: for while they ſcrape upon a flat ſurface, "they bury two grains by ſcraping up one;" beſides its being a work of much greater labour to come at them.

He ſays he always "lays" to loſe the two outſide furrows or drills: if, therefore, he laid his land in ſix-furrow ridges, one third of his crop muſt be inevitably loſt, at ſeedtime; beſides the depredations he is liable to, during the winter, and at the approach of harveſt.

42.

HEDGES.

December 6. The mal-treatment of hedges in this country is painful to look upon: and there appears to be only one way of preventing a Norfolk farmer from deſtroying them.

Unneceſſary reſtrictions, I confeſs, are hateful; but to ſuffer unneceſſary deſtruction of things ſo eſſential to an incloſed eſtate as are live hedges, would be equally unpardonable; and I am determined henceforward to ſtem, *if poſſible*, the vile practices, ſo prevalent in this country, of "outholling" and "cutting kid*:"

* "Outholling"—ſcouring out the ditch—provincially, the "holl"—for manure, without returning any part of the mould to the roots of the quick.—"Cutting kid:"—hacking off the lower boughs of tall hedges; leaving wide-

A regulation of this kind will not be taking from the farmers the privilege of cutting kids for their "paryards," nor of collecting mould for their yards and dunghills; but it will be obliging them, while they furniſh themſelves with theſe two neceſſary articles, to do juſtice to their fences. 42. HEDGES.

Under this regulation the farmer will not calculate how few rods of ditching he can make ſhift with; but how many loads of mould and hundreds of kid he ſhall be in want of. Thus the intereſt of the tenant and that of the landlord will become intimately connected.

43.

DECEMBER 14. This autumn, I met with a ſingular inſtance of *ſowing wheat after turneps by two-furrowing*. (See SOIL PROCESS.) SOWING WHEAT.

The firſt plow ſkimmed the ſurface, and threw it into the laſt-made trench; on this furrow the ſeed was ſown, and covered with the bottom furrow brought up by the ſecond plow;

wide-ſpreading tops, to over-hang the young ſhoots, and ſmother the underling plants; rendering, of courſe, the bottom open and fenceleſs; while the roots of the ſurviving tree-like plants, being left naked of mould, theſe, in length of time, dwindled away for want of a proper ſupply of nouriſhment. See art. HEDGES, vol. I.

the

43. SOWING WHEAT.

the ſeedſman always keeping between the plows, and ſowing the ſeed by hand between the furrows.

The plits being taken off very thin, the two reached only a mean depth; ſo that no freſh ſoil was brought up.

Two plows and one ſeedſman finiſhed from an acre to five roods a day. The harrow was juſt run over to break the ſurface, and let the ſeedling plants freely out. The land is laid up in warps, not in ridges.

This method is ſomewhat tedious; but the plants come up beautifully even, and the ſurface, of courſe, is free from rubbiſh.

The plants do not come up in drills, but promiſcuouſly; occupying the whole ſurface. This the Norfolk farmers ſeem to think preferable to their ſtanding in rows: and, no doubt, the ſoil in this caſe is the moſt uniformly occupied by the plants.

44.

MEADOWS.

December 17. The "water-workers" in Norfolk have a very expeditious way of ſcouring-out old drains, which are grown up with graſs and ſilt.

They firſt mark out the edges of the drain, with a ſharp ſpade, or other inſtrument, cutting

ting thro' the whole depth of the mud. If the drain be wide, they make another cut along the middle, and then croſs it, ſo as to ſeparate the whole into large ſquare pieces of three or four ſpits each. 44. SCOURING DRAINS.

The workman then takes a large hook, with three flat prongs, and a ſtout long wooden handle—provincially, a "mud-croom,"—and, ſtanding by the ſide of the drain, draws out the "tuſſucks;" placing them regularly on either ſide; and, laſtly, with a ſharp ſhovel, forms the bottom of the drain, and ſhovels out the looſe mould.

45.

DECEMBER 18. In my ride, this morning, I obſerved two or three inſtances of young hedges which are ruined, through the bank's being ſet injudiciouſly on the upper ſide of the ditch. HEDGES.

Ditches on hill ſides ſhould be made to face up-hill; eſpecially where the ſubſoil is ſpringy. For if the ſprings work through, under the bank, they ſoon undermine and let down the face, together with the layer, into the ditch.—The outſide of the ditch ſhooting in is of much leſs conſequence.

1782. JA-

46. 46.

REARING CATTLE. 1782. JANUARY 9. Obſerving, to a good huſbandman, that his three-year-olds were rather ſmall; he ſaid, Yes, they are; adding, that his turneps were but indifferent laſt year; and that he was too eager after bullocks; but he now wiſhed he had done better by his ſtore beaſts: for he always found that they paid beſt for "grazing:"—that is, for good keeping.

This was the obſervation of a ſenſible, elderly, judicious, capital farmer; and came immediately from experience.

47.

RENT-DAYS. JANUARY 9. The times of the year for the receiving of rents ſhould be regulated by the produce of the country, and the objects of the farmer's culture.—He ought not to be obliged to diſpoſe of his produce to a diſadvantage, nor ſell it under the market price. Nor ought he, after his money is received or due, to have too great indulgence; leſt he may be tempted to ſpeculations; which, in the end, might hurt both himſelf and his landlord.

In a corn-country, Chriſtmas is of all others the moſt improper time for the farmer to pay his

his rent at: he has juſt time enough to do himſelf all the injury poſſible. Stimulated by an honeſt pride of carrying the whole balance; or fearful of the frowns of his landlord; he hurries out his corn, unmindful of the lowneſs of the price, or the waſte he is committing on his "ſtover." 47. RENT-DAYS.

Were he called upon at Michaelmas, he could not commit this unpardonable waſte: if at Ladyday, he could have no temptation to do it. Beſides, at Chriſtmas, tithe, tradeſmen's bills, the landtax, and other quarterly rates, come upon him: and it is not the loſs of the ſtover only, but the mealmen and maltſters, knowing his ſituation, take their advantages.

This year furniſhes a ſtriking inſtance of the impropriety of receiving at Chriſtmas, in Norfolk.

We have not, yet, had ſcarcely ſo much as a hoar froſt, nor one flake of ſnow; cattle, in many places, are even ſtill abroad, at graſs; yet the major part of the tenants of this neighbourhood have already thraſhed out three-fourths of their corn. Many of their yards are covered ſeveral feet thick with ſtraw, with ſcarcely any intermixture of teathe; and ſome of them without being ſo much as trodden.

47. RENT-DAYS. There is another evil conſequence, in Norfolk, of receiving rents at Chriſtmas: it is full as much as the *poor* farmer can do, with all his miſchief, to raiſe money for his landlord: he dares not lay out a ſhilling on bullocks to feed off his turneps; which he is of courſe obliged to ſell at ſuch a price as he can get, and have them eaten off when, and in what manner, beſt ſuits the purchaſer; whereas, had he time to thraſh out his corn deliberately, he would find money to buy bullocks, and to pay his landlord.

Suppoſing the farmer to have paid his laſt ſhilling to his harveſtmen (which God knows is at preſent the caſe with farmers in general), his only reſource is conſequently his crop. He firſt begins upon his wheat, in order to raiſe money for his ſervants wages, and the pariſh-rates, at Michaelmas. His ſeed-wheat muſt next be thraſhed out, or purchaſed: a few bullocks are probably wanted; and the next quarter's rates, tithe, and tradeſmen's bills, muſt be paid at Chriſtmas. Thus without opening one ſheaf for his landlord, he muſt do conſiderable injury to his ſtover. What then muſt be the conſequence, if, in the ſame time, he thraſh out, in addition thereto, more than his half-year's rent?

How

How differently this matter would ſtand, were tenants indulged, until the latter end of February, or the beginning of March. 47. RENT-DAYS.

The buſineſs of the barn would then take its natural and regular courſe: the ſervants wages and Michaelmas rates being diſcharged, and the ſeed-wheat and ſome bullocks being provided, the farmer would, about the beginning or middle of December, get his ſtock into his yards, and begin in earneſt upon his barley.

By Chriſtmas he would find no difficulty in diſcharging his tithe, tradeſmen's bills, and pariſh-rates; and would have the two principal months for thraſhing before him (beſides perhaps a ſurplus in hand) to raiſe money for his landlord.

His rent being cleared up to Michaelmas, and his flails ſtill being of courſe kept going, his Eaſter and Ladyday rates would be regularly paid; beſides a ſufficient overplus for the purchaſe of ſuch clover, or other ſeeds, as might be wanted during the ſpring ſeed-time.

In April and May, his bullocks travel to market, and, by the beginning of June, his purſe begins again to overflow; but after this his receipts are trifling.

The beginning of June, therefore, is the time when he ought to pay to his landlord as

47.

RENT-DAYS.

much money on account of the current year's rent, as would leave him a ſufficiency (with his dairy and other ſmall receipts) to pay his Midſummer rates, and get in his harveſt.

The firſt of March and the firſt of June have one peculiar advantage as rent-days; not only in Norfolk, but in every other country; they do not interfere with quarter-days; and, in Norfolk particularly, they are leiſure times of the year.

48.

BUILDING.

JANUARY 10. It is economical to *lay tiles on mortar*, or ceil the room they cover; they are otherwiſe ſubject to every guſt of wind; not from its action upon the outſide, but from finding, when pent up on the inſide, an eaſy paſſage through the covering.

An inſtance occurred, the other day: a farm-houſe had two or three yards ſquare of tiling blown off by the late winds; not on the windward, but on the leeward ſide of the houſe; and from over the only room about it which is not ceiled.

49.

JANUARY 10. How ſtrong and laſting is the current of cuſtom! The Norfolk farmers, while

while corn ſold high, were aſſiduous to cultivate every inch the plow could reach: old marl-pits were levelled: nooks and corners grubbed, and broken up: and even bogs were converted into arable land. Graſsland, of courſe, became wholly out of faſhion, and totally neglected: and now when corn is low, the ſame practice ſtill prevails: ſcraps of arable land are ſtill purchaſed at more labour than they are ſometimes worth; while the meadows are ſuffered to remain a diſgrace to the country; notwithſtanding they would pay trebly for improvement. 49. GEN. MAN. FARMERS.

50.

JANUARY 11. The other day, I obſerved in the practice of a ſuperior huſbandman the following method of *deſtroying anthills*. With a common ſpade, ground ſomewhat ſharp, he divided the hill into four quarters. With the ſame inſtrument he then pared off the ſward of the quarters, an inch to two inches thick; leaving the triangular turves pared off faſt at their baſes, folding them back upon the adjoining ſward. This done, he dug out the core of the hill; chopping and ſpreading the mould abroad; and leaving a hollow baſon MEADOWS.

50.
ANT-HILLS.

where the hill ſtood, in order to collect the winter's rains, and thereby effect a radical cure. Laſtly, the folds of ſward were returned as a cover to the excavation, leaving the ſurface graſſy, nearly level, and ſcarcely diſcernible from the ſurrounding ſward.

This operation is aptly called "gelding;" and, though not univerſal, is a moſt excellent practice.

Between Michaelmas and Chriſtmas is the proper time for performing it; for, then, the excavated mould becomes tempered by the winter's rains and froſts; and the folds of ſward have time to unite with the ſoil, before the ſummer's drought ſet in.

51.

MEADOWS.

JANUARY 13. What a diſgrace, and what a field for improvement, are the meadows of this county! The farmers hire marſhes and grazing-grounds at the diſtance of twenty or thirty miles, and give high prices, when at the ſame time many farmers might, with a common ſhare of attention and management, have them, at a much cheaper rate, within the limits of their own farms,

GEN. MAN. FARMERS.

But

But cuſtom and prejudice are doughty champions to deal with: whilſt a Norfolk farmer is beſtowing more "coſt" upon his arable land than, at the preſent prices of corn, he can ever regain from it, he is "doing rarely well by his land;" but the moment the foot of improvement ſteps onto his graſslands, be it even to open a few gripes to let off the ſurface water, the eyes of the country are upon him; for he is "buying his meadows."—Were he to carry a load of muck from his par-yard to his meadow land, a ſtatute of lunacy would be the probable conſequence. 51. GEN MAN. OF FARMS.

Prejudice, however, is not the only thing againſt the improvement of the Norfolk meadows. A want of knowledge in the art of draining is a ſiſter cauſe; for of the few who attempt to drain their meadows ſcarcely any are acquainted with the method of performing it properly. They make their drains much too ſmall, too numerous, and cut them in improper directions; nor do they ever go to a proper depth to do the work effectually; for ſhould they chance to dip to a bed of gravel they have done wonders, and there they ſtop; for their ſpades and "mud-crooms" can go no farther. MEADOWS.

51. MEADOWS. Nor is the method of *draining* the only part of the miſmanagement of the Norfolk farmers in regard to their meadows,—they do not ſeem to be aware that *preſſure* is a main improvement of boggy moory land. I have never ſeen nor heard of a rolier being drawn over a meadow ſince I came into Norfolk!

There are, however, ſome few exceptions to this general mal-treatment of meadows to be met with.

The Rev. Mr. Horſley of Swayfield has drained his meadows in a capital ſtyle, and Mr. Samuel Barber of Stanninghall is manuring his with ſoot, &c. and clearing them from ant-hills, furze, alders, and other incumbrances.

ALDER. This laſt is a great nuiſance in meadows; an alder not only encumbers the ſpot it ſtands on, but is allowed, on all hands, to render moory ſoil ſtill more rotten. It is a vile inhabitant of, or in the neighbourhood of, a meadow; for the ſeeds being blown about by the wind, they are trodden by cattle into the ſoil over the area of the meadow; where ſpringing up among the herbage, the young plants embitter the graſs, and render it altogether unpalatable to ſtock.

In improving meadows, the main object is to diſengage the mould from collected moiſture; for

51. MEADOWS.

for while any part of the black moory peat-bog ſoil lies in contact with water, the whole will, like a ſponge, be filled with moiſture: and it is in vain to attempt to render the ſurface dry, while the bottom remains in water. Therefore, drains deeper than the bed of moor are eſſentially neceſſary.

Meadows have generally a rivulet running through them: this, although it may have worn itſelf down to the gravel, ſhould nevertheleſs (as it in general may) be conſiderably deepened; enough to lower the *ſurface* of the water *below the moor*; and ſtill enough more to allow for a deſcent in the drains to be laid into it.

The rivulet ſhould be deepened (as ſhould all "water-work" be performed) in autumn; when the ſoil is in its firmeſt ſtate: not in the ſpring (as is the almoſt univerſal practice), when the moor is ſopped with water, and the quickſands all alive.

The rivulet, or other common ſhore, being lowered; and the ſand or gravel (if any) ſpread over the adjoining moor (or, if a bad mould, uſed to level the inequality), and the ſurface-water (if any) let off into the ſhore; the meadows ought to remain in this ſtate until the

51. MEADOWS.

the enſuing autumn; by which time the lower margins towards the main drain, will have acquired a degree of firmneſs, perhaps, ſufficient to admit of the lateral drains being cut to their full depth.

Very rotten meadows, lying on a blowing oozy quickſand, cannot, however, with any propriety, be finiſhed the next year: therefore, in theſe, the upper moory ſtratum alone ſhould be raiſed; laying it as far from the edge off the drains as the arm and ſpade can reach.

In the courſe of the enſuing ſummer the mould ought to be turned over to forward its digeſtion; and to bury the weeds, which never fail to grow upon it in great abundance; and which being turned under in the fulneſs of ſap, are very beneficial in promoting the digeſtion of the whole maſs.

In autumn the drains ought to be finiſhed—the inequalities done away, and the manure ſpread over the ſurface; *provided* this can be yet done with ſafety.

But ſhould the quickſand be ſtill ſo ſtrong as to endanger the ſides of the drains, go no deeper the third year than can be done with ſafety; deferring the finiſhing ſpit until another, or even another, ſummer has rendered the ſub-

ſoil

soil firm, and the springs are effectually killed. This is dividing the expence; doing the business effectually; and treading sure ground. 51. MEADOWS.

The drains should not be cut, as is generally the case, perpendicular to the rivulet; but either parallel with it, or, if their mouths be laid into it, in an oblique direction; in order that they may act more effectually upon the subsoil; as well as to clear their mouths the better at the rivulet.

Nor should the open drains be too numerous: for by that means the roller and carriages are prevented from being turned between them.

Above all, the drains ought to be made of a sufficient size: their depth should be regulated by the depth of the moor and its substratum of quicksand, and consequently by the rivulet, which ought to follow the workman a considerable way up the new-made drains. Their width ought to be sufficient to deter stock from attempting to cross them; otherwise the sides are soon trodden in, and the stock endangered.

Nothing is more common than to hear of stock being smothered in the meadow-drains: last summer, a horse was smothered in a suite of meadows, which for a trifling expence might be made firm enough to bear any stock, and lay several weeks before he was found.

The

51. MEADOWS. The utility of large wide drains is obvious in a meadow adjoining to the ſuite abovementioned; a drain ſix or eight feet wide, and five or ſix deep, lays dry a meadow of eight or ten acres: a carriage might, even now, paſs with ſafety by the ſide of it.

If the beds be made leſs than twenty yards wide, there is not, as has been obſerved, room to turn a roller or waggon with ſafety upon them; if, therefore, the open drains, at that diſtance, be not ſufficient to make beds of that width ſufficiently dry and firm, under-drains ſhould be laid into them.

If the beds be made wider than thirty yards, a carriage will be wanted to ſet about the mould, which riſes out of the new-made drains, and which will afterwards ariſe from the parings of the ſides, and the ſhovellings of the bottoms. But if they be made within that width, a man will be able to manure the whole without that additional expence; for if the mould be caſt, in the firſt inſtance, as far as may be from the drains, and be afterwards, in turning it over, removed ſtill farther from them, the fartheſt ſhovel-full will not require to be caſt more than ten yards.

It is obvious that, in draining a meadow in this manner, the paltry gripes and water-furrow with

with which meadows in general abound, would become uſeleſs; and would require to be filled up with alders, other rubbiſh, and dead mould, dug out of the new drains. The ſurface mould however ought, as above intimated, to be reſerved for a better purpoſe; namely, to be ſpread over the finiſhed beds as a manure.—Its effects on a meadow which, laſt year, I had frequent opportunities of obſerving, were ſtriking; it appeared to kill the ruſhes and other aquatics; and brought up a thick matt of white clover, and other luxuriant graſſes. 51. MEADOWS.

52.

JANUARY 19. A ſingular inſtance of fatting ſwine now occurs in this neighbourhood. SWINE.

The other day, Mr. S. of C. had thirty or forty bacon hogs at peas; put into long open troughs, in the middle of the yard. Now, he has fifty or ſixty porkers at barley and oats.

The pigs look healthy and well, and, Mr. S. ſays, fat apace. He keeps the yard well-littered, and they have water to go to.

He ſold fifty laſt week at the Hill at Norwich at nineteen ſhillings and ſixpence, and fifty more this week at home at ſeventeen ſhillings.

52. FATTING SWINE.

lings. He bought them a few weeks ago at about half a guinea a head.

He ſhewed me one which he had killed for Walſham market: the meat was peculiarly delicate, and quite fat enough; it weighed four ſtone, valued at four ſhillings to four ſhillings and ſixpence a ſtone.

Mr. S. ſays, he not only finds that they fat very faſt; but that the drovers are particularly fond of pigs fatted in this manner; they travel better than fly-fed hogs; and do not ſhrink ſo much with their journey.

They are making him a valuable yard of dung, with very little attendance, and without the expence of houſeroom. There is a cart-ſhed in the yard, under which they may run in bad weather.

Mr. S. argues in favor of his plan, that pigs never do better than when they help themſelves, as in ſtubbles, or at a barley-rick: give a pig acorns, he ſays, in a ſty, and they are waſted upon him; but let him pick them up himſelf under the oak, and he will get fat.

Mr. S. mixes one buſhel of oats to a coomb of barley; in order that the pigs may grind the barley, and thereby prevent its paſſing through them

them whole. It has the defired and, indeed, a ſtriking effect.—Mr. S. broke ſeveral parcels of dung, but not the trace of a whole grain of barley in the yard. The oats not being a favorite food, prevent the pigs from eating the barley too greedily; as well as being huſky, they require a longer time to be chewed. Mr. S. treats buck in the ſame manner, with the ſame effect: peas I find are not unfrequently put among buck for the ſame purpoſe. 52. FATTING SWINE.

This is to me a new idea. Mixing chaff with oats for horſes, to promote the maſtication of the latter, is an old, and now almoſt univerſal, cuſtom; and mixing different ſorts of food for hogs, in order to obtain the ſame valuable effect, is ſelf-evidently judicious.

53.

JANUARY 24. Mr. S. of W. a ſteady money-getting farmer, rears his calves in this manner. (See REARING CATTLE, Vol. I.) REARING CALVES.

He begins about Michaelmas, and continues till about Candlemas.

Their food is ſkim-milk with a little wheat-flour. They have alſo chopped turneps in a trough and hay in a rack.

As ſoon as they learn to eat turneps freely, the pail is entirely left off; the turneps affording

53. REARING CALVES.

ing them both meat and drink; theſe with a little hay being their only ſuſtenance. Some farmers give them oats and bran; but Mr. S. eſteems them dear feeding.

The time of their taking to turneps is uncertain: where there are older calves that have learnt to eat turneps plentifully, the young ones readily learn, by picking up the crumbs made by the old ones *.

About March, the firſt-reared are turned out among the fatting bullocks, in the daytime; and in a few days, if the weather permit, are turned out altogether.

During ſummer, they are kept in the clovers, or at other high keep; and, by next autumn, are ſtout enough to ſtand the paryard. This is eſteemed a main advantage of rearing calves early in the ſeaſon; for thoſe reared late in the ſpring want two years nurſing.

The price of calves, about ten days old, is eight or ten ſhillings; and of buds or yearlings, from twenty to thirty ſhillings; ſo that twenty ſhillings is an out-ſide produce of a reared calf; fifteen ſhillings, perhaps, is nearer the par.

* Breaking the turneps with a mallet has been found to induce calves to take to them ſooner than when they are cut with a ſharp-edged tool. Perhaps, pounding them, and mixing the pulp with milk, would be ſtill better.

This

This cannot be adequate to twelve months extraordinary care, expence, and hazard; especially to a large farmer, who has, *at present*, more material objects to attend to.

53.
GEN. MAN. OF CATTLE.

Mr. B. of the same place, convinced of this, rears no calves: he finds that he can *at present* buy young home breds and Scots cheaper than he can rear his own stock. But Mr. B. is a good judge of stock. For a small farmer, or for any one not thoroughly conversant in the business of buying and selling, it may be more prudent, and certain, to bring up his own calves: for, having learned from experience, how much stock his farm will carry, he goes on mechanically; so many cows—so many three-year-olds—an equal number of two-year-olds—and the same number of buds—with every year nearly the same quantity of turneps and clover to feed and fat them on. If his turneps prove under par, he sells part of his three-year-olds; if above, sells part of his turneps; and this seems to be the *natural basis* of the Norfolk husbandry.

54.

FENS.

54.

JANUARY 24. The following is an accurate account of the *peat grounds* of the fens.

	£.	s.	d.
The "turfman" pays for rent	£. 0	4	0
For cutting from 1*s.* 6*d.* to 2*s.*	0	1	9
For "chimneying" (that is, piling them lattice-wise to dry)	0	0	6
For boating to the ſtaith 6*d.* to 1*s.*	0	0	9
	£.0	7	0
Profit and hazard (great quantities are ſometimes ſwept away by the floods)	0	1	6
The ſelling price, *per thouſand*	£.0	8	6

The peats, when cut, are about four inches ſquare (but dry to about three inches and a quarter); and from two to three feet long, or of a length equal to the depth of the moor;—every foot of which, therefore, affords nine peats: each yard 81: each rod 2,450¼: and each acre 392,040: which, at 4*s.* per thouſand, amounts to the ſum of £.78.8*s.*2*d.* an acre: beſides the additional advantage of having uncovered a ſtratum of earth, which, in many parts, produces reed, ſpontaneouſly; and on which, it is highly probable, that valuable aquatic might, on every part, be propagated.

JANUARY

55. 55.

JANUARY 25. The farmers of Woodbaſtwick, in the ſouthern part of this Diſtrict, have their marl chiefly from Norwich, in boats round by Yarmouth, forty or fifty miles. Sometimes they bring it, by way of back-carriage, from Thorp-next-Norwich, about ſix miles; at other times from Horſtead, and other neighbouring pits, convenient for back-carriage: none within five or ſix miles. MARL.

The uſual quantity ſet on is eight or ten middling loads an acre. At Norwich they pay one ſhilling—at Horſtead eighteen pence a load, uncallowed.

The carriage (as back carriage) is reckoned worth about three ſhillings or three ſhillings and ſixpence; ſo that it coſts them about four to five ſhillings a load; or fifty ſhillings to three pound an acre.

The marl brought by the wherries is worth, at the ſtaith, about four ſhillings the middling load.

56.

JANUARY 25. Mr. —— of Woodbaſtwick has eleven large Scotch bullocks (from fifty to FATTING CATTLE.

56.

BULLOCKS IN YARDS.

ſeventy ſtone) at *turneps in the yard.* They eat nearly two load a day—ſix would eat about a load.—They are given to them whole (except the tails, which are cut off in the field) with their tops on; in double bins; with ſtraw ſcattered about the yard; ſerving them both as fodder and litter.

Theſe bullocks coſt the latter end of October one with another about 7*l.* 10*s.* a head. Suppoſe they weigh by the latter end of April ſixty ſtone on a par, and ſell for four ſhillings a ſtone; the produce, deducting the expence of ſale, will be about 4*l.*—at 4*s.* 6*d.* a ſtone, 5*l.* 10*s.*—at 5*s.* a ſtone, 7*l.*

If ſix bullocks eat a load of turneps a day, one bullock would eat thirty loads in ſix months. Twenty loads an acre is eſteemed a fair crop. Therefore, at four ſhillings a ſtone, theſe bullocks will pay 2*l.* 13*s.* 4*d.* an acre; at 4*s.* 6*d.* a ſtone, 3*l.* 13*s.* 4*d.*; and at 5*s.* a ſtone, 4*l.* 13*s.* 4*d.* an acre for the turneps, ſtraw, and attendance: — ſuppoſing them to take ſix months at turneps, to bring them to ſixty ſtone a head; which, I apprehend, is near the truth.

57.

FATTING CATTLE ABROAD.

JANUARY 25.—Mr. Samuel Barber, whoſe accuracy may be depended on, ſays, that twelve acres

acres of turneps upon his Stanninghall farm, have carried thirtyfive fatting bullocks, followed by fortyfive cows, highland cattle, and other lean ſtock, together with fourſcore fatting ſheep, five weeks and three days; that is, reckoning eight ſheep to one bullock, fortyfive fatting, and fortyfive lean bullocks; from forty to fifty ſtone each. 57. BULLOCKS ABROAD.

In ſix months theſe bullocks would not eat, at this rate, quite ſixty acres: but the turneps are very "thight" and very good.

Mr. Barber attributes the good proof of his turneps this year, on his Stanninghall farm, chiefly to their "thightneſs." He ſays he never minds how cloſe the hoers leave the plants, ſo that they draw their hoes between them. He ſays he has ſuffered ſome pounds this year on his Baſtwick farm, through the hoers, in his abſence, being ſuffered to hack them out too thin*. TURNEPS.

The ſame judicious huſbandman ſays, he treats his Stanninghall farm (a light dry ſoil) for turneps, and for olland barley, in this manner: the firſt plowings, whether they be two or SOIL PROCESS.

* Mr. Baker of Southreps, whoſe opinion, in this caſe, is equally valuable, holds out the ſame ideas; ſaying, that he is always attentive to his hoers, to ſee that they do not leave the plants too thin.

57. three, he gives very fleet, and fetches the ſoil up
SOIL PROCESS. the laſt plowing a full pitch; by which means he ſows his ſeed amongſt a mould which has never been expoſed to the drought; and, conſequently, contains a degree of moiſture very favorable to the ſeedling plants.

To this management he attributes, in ſome
TURNEPS. meaſure, his great ſucceſs in turneps this year. They are indeed the beſt in the country, and on a ſoil whereon turneps have not grown, with any degree of ſucceſs, for many years.

BARLEY. For olland barley, he endeavours to break the flag as little as poſſible, ſo that the graſs be killed: he therefore would chuſe not to break up his olland till after Chriſtmas. With this proceſs he ſows the barley abovefurrow.

58.

FARMERS. JANUARY 29. In a converſation, to-day, with two of the firſt farmers in the county, a compariſon between the preſent times and thoſe of fifteen to twenty years ago, became the ſubject.

The price of barley was, then, from five ſhillings to ſeven ſhillings a coomb; of wheat, from ten ſhillings to fourteen ſhillings; and beef three ſhillings and ſixpence a ſtone. Now,

barley

barley is eight ſhillings, wheat twentytwo ſhillings, and beef four ſhillings to four ſhillings and ſixpence; yet, in thoſe days, farmers had plenty of money, and actually increaſed in riches; whereas, now, they are moneyleſs, and are every year ſinking in poverty. 58. FARMERS.

To explain this paradox ſeemed difficult: the price of day labour is ſomewhat decreaſed; ſervants wages the ſame, now, as then; houſekeeping ſomewhat more expenſive, as to the price of its particular articles; but, upon the whole, it is not more ſo; for farmers, principal farmers, now keep leſs company than they did in thoſe times. One of them obſerved, that he pays the ſame price for a coat, and the ſame for a ſhirt, he did formerly; and as to market and other perſonal expences, he is clear that among capital farmers they are leſs now than they were then. The poor's rate, it is true, falls heavy at preſent; but he ſays that he pays only fourteen pounds now for what he then paid ten pounds: this therefore is not of material conſequence; and this excellent huſbandman, ſenſible and well informed as he is, ſeemed willing to aſſign the cauſe to ſome inexplicable hidden myſtery.

58. FARMERS. At length, however, he produced an idea which goes a great way towards explaining the *apparent riches* of former, and the *apparent poverty* of the preſent, times.

In every corner there are moneyed men: formerly they diffuſed their riches through the neighbourhood they lived in:—it was no uncommon circumſtance for a farmer even to be aſked to take money; whereas, now, through a want of private credit and moneyed faith between man and man, and ſtill more through the preſent high rate of intereſt to be made on government ſecurity, the monies which were diſperſed in the country among farmers and tradeſmen are now all called in.

This explains very fully the *apparent riches* of former times and the *apparent poverty* of the preſent: but it does not explain why farmers formerly grew rich, but now grow poor.

RENTS. The late riſe of rents at once fully developed the whole myſtery. For although the uſurer's money might aſſiſt the farmer in purchaſing ſtock, &c. to an advantage; yet this advantage was in great meaſure cancelled, by the intereſt which he had annually to pay for it: whereas the money ariſing from the comparative lowneſs of rent required neither intereſt nor even principal to be repaid.

Thus,

58.
RISE OF RENTS.

Thus, ſuppoſing farms to be raiſed thirty per cent. within the laſt fifteen or twenty years; and ſuppoſing that, among middling farmers, the riſe in the poor's rates, and the extra expence of houſekeeping, is adequate to the advance of produce; the farmer who now juſt makes ends meet on a farm of one hundred and thirty pounds a year, had formerly a ſurplus of thirty pounds left in his pocket to buy ſtock, &c. at the beſt market *.

This, even the ſecond year of his leaſe, he found of great advantage; but the third year, the thirty became ſixty; the fourth, ninety, or perhaps one hundred pounds; for the intereſt, or a proper management of the money, had increaſed his ſtock; ſo that by intereſt upon intereſt, or by other advantages made of the money, a careful, induſtrious, *fortunate* man found himſelf, at the end of his twentyone years leaſe, to be worth eight hundred or one thouſand pounds; and conſequently got, very deſervedly, the name of being a rich farmer.

* A ſtriking inſtance of the loſs ariſing from a want of looſe money to buy ſtock when the markets are low, occurs this year: at Kipping and Kenninghall ſheep-ſhows (a few months ago) the ſame lambs might have been bought for five ſhillings and ſixpence, which are now worth half a-guinea a head.

But

58. But the caſe of the man who now takes a farm of a hundred and thirty pounds a year, is very different.

RISE OF RENTS.

Let us ſuppoſe him to have a capital juſt ſufficient to ſtock it, and help him through the extra expences of the firſt year.

His crops turn out tolerably, and, having common good luck with live ſtock, the neat produce of his farm juſt clears its expences, buys him a new coat, and pays his landlord: but this done, he finds himſelf without a ſixpence left in his pocket for manure, or to go to a cheap market with.

This however is not all. In the courſe of the year, he loſes a cow, perhaps a horſe.—What is to be done? He is pennyleſs, and cannot borrow a ſhilling in the whole country. Why, he muſt either do without, to the great prejudice of his farm, or ſell ſome other part of his ſtock to replace them with.

The next year, his wheat or his turnep crop fails him. He has not a ſhilling beforehand to carry him over the difficulty; he conſequently becomes in arrear with his landlord; his ſpirits are broken; his land not only wants manure, but even labour and teathe; for he is glad to ſell his bullocks before Chriſtmas, to keep

keep his landlord in temper: the conſequence need not be traced. 58.

Thus it appears that the poverty of preſent farmers, more particularly of middling and ſmall farmers, reſults in ſome meaſure from an advance in the expences of houſekeeping and an advance in the pariſh rates; but principally from the preſent ſcarcity of money, and from the late riſe of rents. FARMERS.

59.

FEBRUARY 5. In ſinking a well near Gunton-Houſe, the workmen, it ſeems, traced the tap-root of an oak, through an uniformly white ſand, to the depth, I think, of twenty feet.—The tree was nevertheleſs uncommonly healthy and beautiful. THE OAK.

This ſhews that a ſtrong ſoil is not neceſſary to the production of fine oaks.

There might, however, be one circumſtance favorable to this oak. The ſtratum which it grew in might be impregnated with the drainage of the houſe and offices; for of ſo abſorbent a nature is this bottomleſs bed of ſand, that it drinks up the whole drip of the houſe, together with the overflowings, and waſte water, and ſilt of every denomination. SUBSOIL.

Nor

59.

SUBSOIL. Nor is this a ſingular inſtance of the abſorbency of the Norfolk ſoil; for of a ſimilar nature is the moſt frequent ſubſoil of the county: dig a marl-pit through to the ſand, the water immediately vaniſhes.

60.

REPAIRS. FEBRUARY 5. *Buttreſſes*, to ſtay-up old buildings, are very aukward, very expenſive, and very ſubject to decay, if not well ſecured from the drip of the building they ſupport: yet, if walls loſe their upright, ſomething is neceſſary.

Buttreſſes, however, may frequently be avoided, by thickening the foundation, and forming an arch-like foot or underpinning to the whole part affected.—Witneſs a tall fence-wall at Northreps; and a dwelling-houſe at Bradfield; where a buttreſs, in the front of a good houſe, would have been very unſightly.

The *ſpring* or width at the baſe, as alſo the height, ſhould be in proportion to the degree and height of the bulge to be ſecured.

Where the whole wall has given way and overhangs much, a tall buttreſs may be neceſſary; though even in this caſe, ſupporting the beams and rebuilding the wall from the foundation

foundation is generally more prudent:—a large buttreſs ſwallows up a great quantity of brick and mortar; and, when raiſed, is but a temporary relief. 60. BUTTRESSES

A large blue ſlate forms an admirable *roof* for a buttreſs:—an inſtance occurs upon Antingham-hall farm.

61.

FEBRUARY 5. A neighbouring farmer having one ſide of a cloſe of turneps, which he could not conſume faſt enough to be ſown with wheat, he cut off their tops with a ſpade, gave the tops to his cows, carted the bottoms into a new-made adjoining ditch, (backing the cart and ſhooting them in) and covered them over with a little ſtraw; and, over this, with bramble kids, to keep the ſtock from them. PRESERVING TURNEPS.

Here they lay until wanted in a froſt; when the cart was again backed to the ditch, and the turneps loaded with a fork.

He ſays, that his beace eat them as well, or better, than freſh-drawn turneps; and that, in general, they came out as ſound as when they went in. Had the tops been depoſited with the roots, they would probably have brought on

61. on a fermentation, and have ſpoiled the whole depoſit.

PRESERVING TURNEPS.

Might not this practice be extended to the preſervation of turneps in the ſpring?

Turneps, this year, began to run the beginning of January: they have now, in general, got ſpring ſhoots five or ſix inches long; and, if the preſent open weather continue, the roots muſt be conſiderably exhauſted, and the land very much drawn, long before bullocks in general are finiſhed, or graſs begins to grow. But if they were now (when labour is cheap and plentiful) topped and carted into dry ditches, or formed into ſtacks with ſtraw*, their goodneſs might be preſerved, and the land be got into forwardneſs for barley.

If they were ſtacked in or near the yard, there would not, for ſhed or ſtraw-yard bullocks, be any labour loſt.

Whether, after this remarkably mild winter, the ſpring prove very mild, or very ſevere, they would, by this means, be removed out of harm's way.

62.

THE ASH.

FEBRUARY 7. There is, in a grove at Gunton, a large aſh, (at leaſt a load of timber in

* Perhaps hurdles, ſet chequer-wiſe, would be found convenient receptacles.

it)

it) which is *diſbarked* entirely round the ſtem, about a foot from the ground. On one ſide the upper and lower barks are ſeparated about a foot from each other; on the other ſide not more than three or four inches: they ſeem to be drawing towards each other, and may in a few years unite. 62. THE ASH.

This tree was probably diſbarked by deer, from five to ten years ago; yet it is not only alive, but apparently as growing and healthy as any tree in the grove. VEGETABLE ECONOMY.

63.

FEBRUARY 7. I have frequently obſerved that the face of a ditch over which *ivy* has ſpread itſelf, ſtands invariably. HEDGES.

Perhaps, on a ſandy ſoil, where the face of the bank is perpetually running down like an hour-glaſs, plant or ſow a drill of ivy near the feet of new-made ditches.

64.

FEBRUARY 7. The roof out of repair, the whole fabric is in danger.—Not only the ſpars, but the "planſher," nay, even the ground-floor, I have ſeen rotten through a bad roof. REPAIRS.

Perhaps,

64.

REPAIRS.

Perhaps, ſend a thatcher and bricklayer round to each farm annually: if nothing be wanted upon it, there may no doubt be half a day's labour loſt; but if there is, a few ſhillings laid out in time may, in a courſe of years, produce a conſiderable ſaving.

If the landlord take care of the roofs and foundations—the tenants will, for their own conveniency, be ready enough to remind him of the repairs wanted on the inſide.

65.

MEADOWS.

FEBRUARY 7. A ſtriking inſtance of the ſhameful management of meadowland in Norfolk occurs upon the church-farm at ——.

The late tenant was afraid to truſt his ſtock in one of his meadows: he has loſt ſeveral cattle and horſes in it—the ſkeleton of a horſe now lies there.

The preſent tenant could not get his ſtock into it, until, at a conſiderable expence of heath and ſand, he made a gangway.—To him (who has taken it for only one year certain) I could not value it at more than five ſhillings an acre: yet I will venture to ſay, that for the trifling

65.
MEADOWS.

trifling expence of twenty ſhillings an acre, properly laid out in the courſe of next ſummer, it would, in two or three years time, be worth from twelve to fifteen ſhillings an acre.

I will give an eſtimate of the expence, to ſhew the *real* improvement which the meadow lands of Norfolk are capable of.

This meadow is a parallelogram lying on a flat, and contains five acres, two roods, ſeven perches.

A rivulet runs on one ſide of it, upon a bed of gravel, and five or ſix feet below the ſurface of the meadow. Acroſs the meadow, perpendicular to the rivulet, are two drains, grown up with haſſocks, and trod in by cattle; and round it is a watery ditch, alſo full of graſs and mud.

There are about eighty ſtatute rods of ditching, and about forty ſtatute rods of draining.—The ditches might be ſcoured for a ſhilling, the drains be opened for ſixpence, the long rod.

80 ſtatute is about ſixtythree long rods, at 1*s.* - -	£. 3	3	0
40 ditto, about thirtyone, at 6*d.*	0	15	6
	£. 3	18	6

But the drains could not be opened level with the rivulet for that money; nor could

65. MEADOWS.

they, for that, be made fences: for one shilling a rod they might, I apprehend, be done effectually, which is an addition of 0 15 6

£4 14 0

Nor could the ditches, perhaps, be carried round level with the rivulet (which they ought to be, the workmen leading a dead water all round) for one shilling a rod: for fourteen pence I believe they might: this is a further addition of - - - - 0 10 6

£5 4 6

Besides this, three trunks, or arches, would be wanted as an entrance, and for communications between the beds; the stuff, too, would require to be set about: these, however, come under the idea of annual and ordinary expences; we may therefore say, that for the inconsiderable purchase of five guineas an improvement worth fifty or sixty pounds might be obtained.

Perhaps, when a meadow is so situated that the rivulet cannot be sunk below the moor, lay the main drains into wells, dug at a convenient distance from the rivulet, and pump the *remaining* water into it. One length of tree would do, and a man would pump out a great quantity of water in a day; and what are a few days works

works compared with the difference between a drained and an undrained meadow? 65.

DRAINING. QUICKSAND.

Perhaps, a ſtubborn quickſand might be overcome by digging a well near it.

66.

FEBRUARY 8. It is an excellent cuſtom of the Norfolk farmer to erect *rubbing poſts* in the different parts of the incloſure he is feeding or teathing; they keep the ſtock from the fences, and furniſh them, no doubt, with an agreeable, and perhaps a ſalutary, amuſement. CATTLE.

Some, I ſee, draw the crown of a tree, with the lower part of the boughs left on, into the middle of the cloſe: this is leſs trouble than putting down a poſt, is eaſily rolled out of the way of the plow, and ſeems to be ſtill more agreeable to the cattle. RUBBING POSTS.

67.

FEBRUARY 9. Mr. Arthur Bayfield (whoſe good ſenſe and judicious management have repeatedly engaged my attention) ſows the principal part of his wheat in four-furrow work, with this peculiarity:—He ſows only half the ſeed before the plows. (See WHEAT, Vol. I.) SOWING WHEAT.

The firſt plowman ſets out a very wide "back;" ſo that the tops of the firſt two furrows

67. SOWING WHEAT.

rows do but barely touch each other. The ſeedſman follows, and ſows the remaining half of the ſeed in the trenches made by the firſt plow.—Another plowman follows, and, with a neat narrow furrow, covers the ſeed and makes up the ridges.

It was on my obſerving to him, the other day, the evenneſs with which his wheat comes up, that he told me his method of putting in the ſeed.

Farmers in general, he thinks, ſow too much of their ſeed on the warps, by which means the tops of the ridges have more than their proportion of ſeed; unleſs the ridges be made very narrow, which occaſions a loſs of labour.

Mr. B.'s four-furrow work is nearly as wide as the ſix-furrow ridges of ſome farmers; and it is impoſſible for wheat to come up more beautifully than his does this year.

68.

TURNEPS.

FEBRUARY 9. Laſt year, there were turneps ſold as high as 5*l.* an acre; a price ſeldom, if ever, before known in Norfolk. At the beginning of this ſeaſon, four pounds ten ſhillings, ſome ſay four guineas and a half, an acre was refuſed

refuſed for turneps—The ſame turneps are now worth about three pounds.—Good turneps are ſold for fifty ſhillings, tolerable ones for forty ſhillings. 68. PRICE OF TURNEPS.

The reaſon for this rapid fall of turneps is twofold: the openneſs of the winter, and the ſcarcity of bullocks, this year; owing to their high price at Michaelmas, and to the poverty of the farmers.

A. gives forty ſhillings for tolerable ones, and is allowed to bring ſome home; but he pulls and tends the reſt himſelf (*A.* ſays pulling and ſtraw is worth twenty ſhillings).

B. took in lean three-year-olds at two ſhillings a week, but their owner would not continue: *B.* therefore ſold him the turneps at fifty ſhillings an acre (middling); *B.* to pull and tend; but the purchaſer to find ſtraw (*B.* reckons pulling, &c. worth ten ſhillings an acre).

C. agreed (early in the ſeaſon) with *P.* at three pounds; *P.* to pull, tend, and find ſtraw; which *C.* reckons at fifteen ſhillings, viz. five ſhillings the ſtraw, and ten ſhillings the attendance.

69.

BULLOCKS AT TURNEPS.

69.

FEBRUARY 9. It is a general obſervation, that in this remarkably warm open winter, ſhed-bullocks have done very badly; while bullocks abroad have done extremely well.—A perſon, who is a competent judge in this matter, inſtances ſome bullocks, which he ſaw the other day, that have ſcarcely got any thing, during ſeveral weeks they have been at turneps:—his remark was, that they ſweat out as much as they lay on; that their coats are continually wet; their backs being covered with drops of ſweat.

In cold winters, bullocks are obſerved to do beſt in ſheds; but they do not travel ſo well to market, as bullocks fatted abroad or in the open yard.

This being an intereſting ſubject, and of great importance to this and every other light land Diſtrict, I have collected the particular practice of ſuch individuals as buſineſs, or other circumſtance, has thrown in my way.

Mr. Barber, at Baſtwick, (a ſomewhat tender ſoil) gives his bullocks turneps in bins in the open yard. At Stanninghall, (a dry firm ſoil) he keeps them wholly abroad, ſhifting them every day, or every two or three days, giving them ſtraw in a moveable four-wheeled ſtraw-rack.

Mr.

69. BULLOCKS. AT TURNEPS.

Mr. Thomas Seago, of Hanworth, throws the beginning of the ſeaſon, and afterwards chops the turneps, and gives them in bins in the ſtrawyard.

Mr. John Hylton, of Felmingham, fats them abroad.

Mr. Arthur Bayfield, of Antingham—Abroad in the day; and, if near home, puts them into the ſtrawyard at night; but rather than drive them any diſtance, backward and forward, keeps them abroad altogether, with very little ſtraw. Says, that his land being light requires to be trodden. Thinks that bullocks kept wholly in the yard ſhould have their turneps in covered bins,—a kind of double narrow ſhed acroſs the yard; for in caſe of froſt and ſnowy weather, the turneps given them, overnight, in open bins, are frequently left untouched, and are obliged to be taken out, and replaced with freſh ones, the next morning.

Mr. Robins Cook, of Felmingham—Abroad in the day; in the ſtrawyard at night; no turneps in the yard, nor ſtraw in the field.—Says, they eat the ſtraw greedily on their coming into the yard in the evening:—uſed to give them ſtraw upon the headlands; not ſcat-

69. BULLOCKS AT TURNEPS.

tered about thin, but all in one place, ſo as to be able to make a little manure; but this was only becauſe he had not a ſpare yard to "ſtow" them in.

At Albro' (a more tender ſoil) he uſed generally to graze half a dozen bullocks in the houſe: he attended them himſelf, chopping all their turneps. They eat, he ſays, (contrary to common opinion) as many turneps in the houſe as they do abroad: ſix of them more than a load a day. Four o'clock in the afternoon, he ſays, is their principal hour of eating: —uſed to rack them up with the tops: the offal thrown to the buds.

Mrs. Swan, of Suffield, fats them abroad.

Mr. Foſter, of Bradfield—Abroad; with ſtraw ſcattered under the hedges.

Mr. Jonathan Bond, of Walſham—Fourteen abroad.

Mr. Henry Helſden, of Antingham, fats them at *two years old*:—has no meadows, and cannot keep them till three years old. Has them always at "high keep:" being from the time they are dropt either at turneps, clover, or in the ſtubbles:—fats them abroad.

Mr. James Helſden, of Suffield—Sixteen abroad.

Mr.

69.

Mr. F. Le Neve, of Bradfield, has ten abroad, and two cows "by the head."—Why keep the cows in the houſe and the reſt abroad? "Becauſe the cows are backwarder than the "other, and I ſhall be able to bring them for-"ward by good tending in the ſhed." BULLOCKS AT TURNEPS.

Mr. John Joy, of Walſham, has five Scotch; one four-year old Norfolk; eight three-year-old ditto; one two-year-old ditto; and two cows with their calves by their ſides.

The four-year-old Norfolk is a beautiful bullock, and very forward:—the three-year-olds, being more given to growing, do not fat ſo faſt. Mr. Joy is clearly of opinion, that four-year-old Norfolks will beat any Scotch. BREED OF CATTLE.

The cows and calves are quite new to me; though Mr. Joy ſays, that "running calves" are, and have been, very common things in this country. They are ſent up to London with the cows, and have been known to fetch as high as ſix or ſeven pounds a piece*. The cows are very old; yet notwithſtanding the RUNNING CALVES.

* I was afterwards told that a gentleman near Norwich ſold a year-and-half-old calf for ten pounds! It was offered to the butcher at nine pounds, or at five ſhillings a ſtone: he accepted the latter. On weighing it, the four quarters weighed forty ſtone! But it ſeems to be well underſtood that "running calves weigh like lead."

calves

69. RUNNING CALVES.

calves draw them, the wonderful effect of turneps is ſuch, that they are getting fat apace: one of the calves (a heifer) is as ſleek as a mole; and has already dropt a dug of conſiderable ſize: the other is not ſo forward; its mother being very old, and gives little milk. The calves eat turneps as freely as the reſt of the cattle.—What an admirable end is this for old cows!

REARING CATTLE.

Some of the three-year-olds, and the two-year-old, are ſpayed heifers; but, through the negligence of the cutter, ſome of them have not been clean ſpayed, and are frequently running to bull; a circumſtance which is of great hindrance to their fatting.

BULLOCKS AT TURNEPS.

Mr. Joy keeps his bullocks entirely abroad; giving them ſtraw ſcattered over the cloſe; or, in hard weather, under the hedges: he never puts them into the yard at night; thinking that driving them backward and forward is prejudicial to their fatting.

FATTING CATTLE.

Mr Jonathan Bond, of Southreps, has eight *two-year-olds* at turneps; generally grazing two-year-olds: this year they are rather backward; but expects they will reach about thirty ſtone a piece, with about ſix weeks graſs. Two-year-olds, he allows, do not finiſh ſo early as the three-year-olds; but if they be kept well from

from the time they are dropt, they pay very well. It is obſervable that the heifers are not only forwarder but larger than the ſteers, though dropt at the ſame time: they are open, and had the bull about Chriſtmas. 69. FATTING CATTLE.

Mr. William Mann, of Bradfield, has ſix *two-year-olds* at turneps; they are doing very well; and, with a little graſs, will be very good meat. They were early calves (between Michaelmas and Chriſtmas) and have a mixture of the Suffolk breed in them. One of them *(a dun, but horned)* will weigh upwards of forty ſtone: this is one inſtance in favor of the Suffolk breed. BREED OF CATTLE.

Mr. Baker, of Southreps, keeps his beautiful heifers bought at St. Faith's (See MIN. 27.) entirely abroad; giving ſtraw under the hedges; and ſhifting them every day: they have thus far done well indeed. BULLOCKS AT TURNEPS.

70.

FEBRUARY 9. In riding over the eſtate, I have alſo made a point of collecting information reſpecting the rearing of calves, a ſubject of conſiderable importance in every county. REARING CALVES.

Mr. Barber rears none: he fats his calves, and kills them for the Ped market at Norwich. (See CATTLE, Vol. I.)

Mr. Thomas Shepherd, of Northreps, rears none: but ſhrewdly obſerves, that he cares not how

70. REARING CALVES.

how many his neighbours rear. Mr. S. (as well as Mr. B.) is a judge of ſtock, and a frequenter of fairs and markets; and finds, no doubt, he can buy young ſtock cheaper than he can rear them.

Mr. —, of —, gives milk once a day (look but indifferently) with turnep-tops and oats and bran mixed together in a trough, and hay in a rack (the hay bad):—begins about Chriſtmas. —Says, that one early calf is worth two backward ones; and inſtances it from laſt year's experience.

Mr. William Barnard—Milk twice a day with bran only (look well):—gives neither turneps nor tops, till they are a month or five weeks old.

Mr. John Hylton rears twelve to fifteen (he has a marſh)—reared three this ſeaſon in Auguſt; they are now almoſt as large as yearlings. Theſe had milk four months; in common, he gives milk twice a day, with turnep-tops, for two months; and once a day for as much longer as he has milk: if milk be ſcarce, he makes milk-porridge.

Mr. William Sewell rears eight or nine.—Says, that he has had calves get quite fat on turneps and hay, when he has had bullocks in the yard; and the calves have been, of courſe, well tended;

tended: much, he says, depends upon attendance.

70. REARING CALVES.

Mr. Robins Cook rears about twelve; keeps them at the teat twice a day, till three or four weeks old; and once a day, till three or four weeks older: then offers them the pail; but, if they refuse, or are difficult to learn to drink at that age, he leaves them to take their chance at turneps, hay, and water.

Generally loses three or four a year in the gargut*.

Mr. Arthur Bayfield rears twelve to fifteen: used to rear eighteen or twenty.—Takes them off the cow at a fortnight or three weeks old: finds no difficulty in learning them to drink at that age:—keeps them at milk twice a day, until ten or twelve weeks old; with turneps, turnep-tops and hay; but no bran, &c. Cuts the turnep-tops, to prevent their being littered about.

Mr. Jonathan Bond, of North-Walsham, keeps eight cows; rears ten calves: buys them chiefly of the drovers:—drove calves very dear this year; from twelve to fifteen

* "Gargut," or "murrain:" taken suddenly: presently become putrescent; with the skin parched and rigid.

shillings

—O. REARING CALVES.

ſhillings at a fortnight old. Gives them turneps, hay, and about three pints of milk, once a day. Says, that too much milk makes them neglect the turneps; but keep them ſhort of milk, and they ſoon take to them: turns them to graſs about the middle of April; by which time he reckons they coſt him about twenty ſhillings a head; and ſays, that a bud of a year old may be bought for twenty-five ſhillings. But he adds, that bringing them up within himſelf, he does not miſs the charge of them.

Generally loſes two or three every year by the gargut.

GEN. MAN. OF CATTLE.

Mr. James Helſden, of Suffield—Eight cows: rears about ten calves; fats ſixteen to twenty bullocks (his farm of the middle ſize): gives his calves hay, turneps, and milk, twice a day, while young; after ten weeks or three months, once a day: begins about the middle of March to put his oldeſt out into a piece of turneps, three or four hours in the middle of the day, to play about and eat the turnep-tops.

Mr. ——— keeps eight cows; uſually rears eight calves; but turneps being ſcarce, he rears none this year, meaning to buy eight or ten buds at the ſales.

Mr.

70.

REARING CALVES.

Mr. John Waller brings up ſix: takes them off at two or three days or a week old: milk twice a day, as long as he can give it; and then once a day, as long as he has it; gives alſo hay, turneps, and bran; but no oats.

Mr. John Joy takes them off at about a fortnight old: milk twice a day, for about a month, and once a day, for a month or ſix weeks longer; until they can be turned out in the ſpring into a pightle of turneps: alſo gives them turneps, hay, and barley ſtraw, which, by way of a change, they eat as well as hay. Mr. Joy generally loſes ſome every year in the gargut. He ſays, as ſoon as they are dead there is a jelly formed between the ſkin and the fleſh: they are taken ſuddenly, and die preſently after being taken: ſome bleed and rowel them with "gargut-root" *(helleborus fœtidus)* in their tail or dewlap: ſeldom recover.

GARGUT.

Mr. ———, of Southreps, begins between Michaelmas and Chriſtmas.—Takes them from the cow about three weeks or a month old, and endeavours to make them "luſty;"—gives them about half a pint of milk once a day, with hay, oats, and bran; *but no turneps.* I aſked him why? He gave me for anſwer, that his father, mother, himſelf, nor any of the family,

70. FATTING CATTLE.

mily, had ever given their calves turneps:—he added however, that oats and bran are heartier food; and that the milk is enough for them without turneps: his calves, no doubt, look well, and so do his buls and two-year-olds.—Asked him if he did not find oats and bran expensive. He said, that the six, which he has now, have eaten about three bushels of oats, and two bushels of bran, in about six weeks; which time they have been from the cows; they being now about ten weeks old. This is no great expence; not being above threepence a head a week *(if he be accurate)*. He speaks in raptures of oats for calves. He keeps them at milk until the turneps are gone; when he begins to make cheese.

Mr. William Mann, of Bradfield, has already eleven this year: begins between Michaelmas and Christmas: lets them suck ten days: milk twice a day for a month or five weeks afterwards; and once a day until they do well upon hay and turneps; or until he can turn them out a few hours in the day into a turnep close. Thinks that the milk is of little use to them, after they begin to eat turneps well: gives them the turneps whole; only tailing them, and freeing them a little from dirt: gives no

oats

oats nor bran: he is remarkable for fine young stock: he is very assiduous in keeping his calves well-littered. 70. REARING CALVES.

Mr. Henry Helsden, of Antingham, begins before Christmas: takes them off at a fortnight old; sometimes at three weeks; by which time they get "rarely strong," but do not take to the pail so well: gives them new milk twice a day for about a fortnight; and skimmed twice a day for a fortnight longer; and about three pints or two quarts once a day afterward; until the weather be warm enough to turn them out entirely to turneps: gives them the turneps in the house, whole, thrown upon the litter: learns them by cutting off the crown, breaking up the surface, and pouring milk into the inequalities. If hay be scarce or bad, gives a few oats and bran: look very well.

71.

FEBRUARY 10. Young Swann, of Suffield; had, the winter before this, some of the best turneps in the country. Seeing him, last summer, sowing some in what appeared to me a slovenly manner, the surface being covered with chick-weed, groundsel, charlock, and other rubbish pulled up by the harrows, I asked him SOWING TURNEPS.

71.
SOWING TURNEPS.

why he did not give his land another earth before he ſowed it. He anſwered, that the land was not foul; and that he, purpoſely, let the ſeed weeds get to a head: having found, from the experience of two or three years back, that his turneps ſucceeded beſt when the ſeed was ſown in that manner: ſaying, that he believed the "wreck" ſhaded the young plants, and kept the fly from them. I aſked him if the rubbiſh was not in the way of the hoe: he ſaid, not much; for being young, and tender, it withers away to little or nothing, before the plants be fit for the hoe.

Two or three days ago, I examined this cloſe of turneps; the plants are *thinner* than one would wiſh, (perhaps owing to their being badly hoed) but there is not a patch, *deficient*, in the whole piece.

There may be two advantages ariſing from letting the ſoil lie ſome time before the laſt plowing: it acquires a degree of texture, and moiſtneſs, favorable to the infant plants; and is prevented, by the dead weeds, from being, afterwards, run together by heavy rains.

72.

CATTLE AT TURNEPS.

FEBRUARY 10. Aſking Mr. A. Bayfield, if his cattle were not ſometimes *choaked* with turneps;

turneps; he ſaid no; he never loſt but one in his life. I aſked him if he uſed a rope: he ſaid he had one; but never uſed it, except at the time he loſt his cow. If ſalt and water will not cure them, he pours down a hornful of *ſalt and melted greaſe*: ſuch as hogslard or any kind of common greaſe. This he never (except the once) found fail. 72. CATTLE AT TURNEPS.

This is an idea worth preſerving: warm oil and ſalt would perhaps have the ſame effect.

Mr. Bayfield, who may be called one of the moſt orthodox farmers in Eaſt Norfolk, is clear in that a *three-year-old* "homebred" will fat as kindly as a *four-year-old* "marſhlander" or "Scot." BREED OF CATTLE.

He inſtanced it, to-day, in a three-year-old of his own bringing up, which he bought, when a calf, of the calf-drovers; and which evidently diſcovers a near relationſhip to the ſhort-horned breed. He is now at turneps with the reſt of the three-year-old Norfolk ſtock; but, notwithſtanding he was at head keep all laſt ſummer, he is nevertheleſs ſtill a rawboned growing ſteer; while the Norfolks are as ſoft as moles, and ſeveral of them begin to drop their points. The Norfolks will fat to from forty to fortyfour ſtone; the Lincolnſhire, if

72. he were to be kept another year, would reach at leaſt ſeventy.

BREED OF CATTLE.

But this peculiar quality of the Norfolk ſtock does not depend on ſize; for Mr. B. ſays, that a three-year-old Scot (ſtill ſmaller perhaps) is as difficult to fat as a three-year-old marſh-lander. He ſays, it is bad management to attempt it; but keep them on until they be four years old, and they will make famous "over-year" bullocks: adding, that at that age they will generally pay for keeping over-year.

73.

FARM-YARD MANAGEM.

FEBRUARY 10. It ſeems to be a received idea among the Norfolk farmers, that the ſtraw which is *eaten* by cattle is in a manner waſted as to manure. Mr. S. I remember, as an argument in favor of his plan of fatting pigs looſe in the open yard, ſaid what a rare parcel of muck they make, compared with what "neat beace" would have made from the ſame ſtraw. "A parcel of lean hungry ſtock, ſays he, come "into a yard and eat up all the ſtraw: ſee there "lies a bundle of ſtraw as big as a man can "carry."

Mr. B. the other day, intimated the ſame idea: however, on putting the queſtion, he acknowledged

knowledged that a little dung and a little trodden ſtraw do well together. 73. FARM-YARD MANAGEM.

In the north of England, the farmers make their cattle eat almoſt every blade of their ſtraw, ſo that they have ſcarcely any left to litter their ſtalls with. Give a Yorkſhire and a Norfolk farmer equal quantities of ſtraw, the Yorkſhireman would keep more cattle, and carry out his dung at a leſs expence; whilſt the Norfolkman would make more muck. But quære, Whether is the manure better or worſe? and quære, Which of the two, upon the whole, is the better management?

Much, perhaps, may depend on the quality of the ſoil to be manured. A large quantity of long dung would, perhaps, for ſtiff cold land, be better than a ſmaller quantity of ſhort. But perhaps, for a *loamy* ſoil, ſhort dung is the beſt.

74.

FEBRUARY 12. In my rides, this winter, I have endeavoured to inform myſelf reſpecting the *winter-management of ſtore-cattle*. CATTLE.

Mr. A. Bayfield's yearlings and milch-cows follow his bullocks, and lie in the paryard at night: his two-year-olds, and dry cows, go abroad in the meadows, &c. in the day, and are

74. WINTER MANAGEMENT OF CATTLE

put into the par at night: they have not yet had a turnep. Mr. B. ſays, however, he ſhall now begin to give them ſome; for if young ſtock are ſtarved in the ſpring, they are ſtinted for the whole year. Cows in calf, he alſo juſtly obſerves, will do with leſs keep than any other ſtock, until within a few weeks of their calving.

Mr. John Hylton.—His turneps failing, he has few bullocks this year; and theſe he buys turneps for; and brings home ſome for his cows. Neither his two-year-olds, nor even his buds, have yet broken a turnep this year; he having the principal part of the few turneps he grew ſtill upon the ground; ſaying, that he ſhould be diſtracted if he had not a plenty of feed in the ſpring, ſo as to be able to favor his ollands, until they got a good bite, and the ground covered. A good farmer never ſtarves his ſtock.

Mr. Jonathan Bond, of Walſham, makes three diviſions in his paryard: his buds; his two-year-olds; and his cows. Says, that the gargut, ſome people think, comes from the buds being "horned" by the larger cattle; but ſays, he does not believe that there is anything in it; for notwithſtanding his precaution, he has loſt three, this year, by the gargut.

Mr.

74.

WINTER MAN. OF CATTLE.

Mr. James Helſden, of Suffield, ſtows his buds in a battoned ſtack-yard, at the end of a barn. He always takes care to place ſuch corn in this ſtacking-place, as will require to be "barned" the beginning of the ſeaſon; ſo that he has it every year free in time enough for a "calves par" (a good plan).

Mr. John Joy, of Walſham, has now ſix or eight cows, ten two-year-olds, and eleven buds follow his bullocks: his young ſtock had no turneps till after Chriſtmas.

WINTER KEEP ON TURNEPS.

Mr. Edward Bird, of Plumſtead, has his two-year-olds out at keep as followers at one ſhilling a week: they have plenty of turneps, and go into a paryard at night.

Mr. William Mann, of Bradfield, has eight buds out at keep for tenpence halfpenny a head a week. They have their fill of freſh turneps every day; going "at head;" not as followers. He grazes his two-year-olds, this year: in general he ſells them in the ſpring to be kept over-year; but this year they being forward he fats them himſelf, and they are doing extremely well.

75.

GEN. MAN. OF FARMS.

75.

FEBRUARY 12. Every ſoil ſeems to have its own ſtock.

In Lincolnſhire the ſoil is rich; the graſs long and ſoft; and the ſheep there are large and inactive: In Norfolk the ſoil is leſs productive; the graſs ſhort and hard; and the ſheep light and active.

A ſheep-walk, in this neighbourhood, ſtocked jointly with theſe two *varieties* of ſheep, contains alſo a *variety* of ſoil: one part lying low is a rich, moiſt ſoil; bearing a ſoft rich graſs: another lies high, and is a drier lighter ſoil; bearing a hard benty graſs.

BREED OF SHEEP.

The preſent ſtock were principally bred in this ground; and, whether Norfolk or Lincolnſhire, were many of them perhaps dropt near the ſame ſpot on the ſame day; nevertheleſs turn them miſcellaneouſly into this ground and they will, in a ſhort time, ſeparate themſelves, even to a ſheep; the Lincolnſhires * drawing off to the Lincolnſhire ſoil; and the Norfolks to their own dry ſandy loam: and, whilſt there continues a plenty of graſs in both parts, the two breeds will keep themſelves as diſtinct and ſeparate, as rooks and pigeons.

* Including a mixture of the Huntingdon and Leiceſterſhire breeds.

76. 76.

FEBRUARY 12. The long-wooled ewes (ſee laſt MIN.) have lambed with great difficulty, this year. The ſhepherd has been obliged to aſſiſt the major part of them. BREED OF SHEEP.

Theſe ewes were *therefore* kept at graſs until after they had dropt their lambs; the ſhepherd having being taught by experience that ewes at turneps are liable to mortify, on receiving the ſmalleſt injury in lambing; much more liable than at graſs. MAN. OF SHEEP.

77.

FEBRUARY 12. There ſeems to be ſomething peculiar either to the air or the ſoil of this county. The face of a ditch, though formed of a dead ill-coloured ſubſtratum of mould, becomes, in a few years, black and rich in a high degree; ſo as to be coveted by the farmer almoſt as much as dung. When he re-makes his fence he carefully ſaves this rich, or rather enriched, mould (for according to the cuſtom of ditchers the face is always made of the worſt mould): or, if he throw down a fence, he as aſſiduouſly preſerves both the face and the back for the bottoms of his farmyard or dunghills. SOIL.

Does not this incident afford us an idea applicable to the enrichment of the ſoil in general?

77. SOIL PROCESS.

ral? Is it not highly probable, that by ridging up a fallow ſo as to reſemble the banks of ditches, or as nearly as could be done with implements and horſes, the ſoil would thereby be meliorated?

It might certainly be done in this way: with a common plow, gather up the ſoil into four-furrow or ſix-furrow ridges, and afterwards, with a heavy double-mould-board plow and a ſtrong team, force up the whole, by degrees, into high, ſharp, angular ridges; which, in due time, might be reverſed in a ſimilar manner*.

78.

MAN. OF SHEEP.

February 16. Laſt night being uncommonly ſevere, by wind froſt and ſnow, I roſe early this morning, to obſerve the effects of ſuch unuſual ſeverity upon the young lambs.

I expected to have found them ſhivering and ſetting up their backs, pinched through with cold: inſtead of which they were prancing againſt the trees, and running races in a ſtack-yard upon ſome hay which the ewes had pulled out, as if the ſun had ſhone out in the middle

* This would likewiſe give an opportunity of deepening the ſoil; and of forming, if practicable, a freſh ſoil. (See Soil, Vol. I.)

of

of April!—not one pitiful tone, nor a crooked back, among near a hundred and fifty. 78. MAN. OF SHEEP.

The ewes have been well kept all winter; and have now plenty of turneps, and a rough hay-ſtack to run to. This ſhews the effect of good keep: the ſhepherd very properly obſerved, that let lambs have plenty of milk, and they neither fear nor care for any weather.

What a pleaſure, and how profitable, to do well by ſtock! Had theſe ewes been ill kept, numbers of lambs muſt have been loſt during the laſt fortnight of ſevere weather; whereas, with their preſent fluſh of milk, ſcarcely one, of ſeven or eight ſcore, has ſuffered by it.

79.

FEBRUARY 23. A conſiderable part of a farm which lies toward the coaſt, being hilly and very badly ſoiled—more eſpecially the tops and ſides of the hills, which have always been full of rabbits in ſpite of all endeavours to deſtroy them—the tenants laſt year applied for leave to convert this part, about ninety acres, into a rabbit warren. Leave was given, and an allowance made them of half the eſtimated expence of raiſing a ſodwall fence round theſe ninety acres. RABBIT WARREN.

The

79. RABBIT WARREN.

The fence is nearly finiſhed, and the warren has, this year, turned out beyond expectation: it is valued, by one who ought to be the beſt judge of its worth, at forty pounds a year; which is nine ſhillings an acre.

As the part of a farm, theſe ninety acres are not worth five ſhillings an acre: at the preſent price of barley, they are not worth more than four ſhillings an acre.

Thus, for ten pound, a *real* improvement of twenty pound a year has been made and ſecured; for the warrener will, through neceſſity, hereafter keep the fence in repair.

The fence is made about four feet high, and three feet thick; faced with greenſward; and capped with furze, ſo as to project eight or ten inches over the face. Some of it was done for a ſhilling a rod; but the ſpring putting in, fourteen or fifteen pence a rod of ſeven yards was obliged to be given.

A neighbouring warrener, this winter, gives nine-pence for the wall, without the capping; which he does not mean to put on till the wall be thoroughly ſettled. This is very judicious: ſeveral rods of that abovementioned ſhot down in different places.

There are ſeveral patches in the vallies and ſome on the tops of the hills which have uſually been

been tilled. Some of these were last year, and some of them ought to be every year, cultivated for the rabbits: thus, when the grass gets foul or mossy, plow it up; fallow; sow turnep-seed for present feed (they will not let rape get up), and to prepare the soil for barley and grass-seed the ensuing year. Thus a regular succession of feedage might be kept up. 79. RABBIT WARREN.

The way the Norfolk warreners take to destroy eagles, kites, and other birds of prey, is natural and simple. These birds are shy and suspicious: they like to settle where they can have a clear view round them for some distance: a naked stump or a hillock is their favorite resting-place. The warreners, therefore, raise mounds of earth of a conical form in different parts of the warren, and place steel traps upon the points of those artificial hillocks.

80.

FEBRUARY 28. About two months ago, I took a sample of wheat to North-Walsham market; with an intent to make myself acquainted with the business of the corn-markets of this country. MARKETS.

North Walsham is an afternoon market (see MARKETS, Vol. I.); corn all sold by sample; some

80. N. WALSHAM CORN-MARKET.

ſome in the market place; but chiefly at the Inns.

Having made my election of a miller, and finding that he "quartered" at the Bear, I went to his room (he was not in till near ſix) and ſhewed him my ſample: namely, about two handfulls, put in a piece of brown paper; which, agreeable to the faſhion of the country, was gathered up in the hand, and tied with a ſtring, in the manner of a pounce-bag.

He aſked the price; I told him the beſt he gave that day: he ſaid a guinea was the higheſt: I had previouſly underſtood that a guinea was "the top of the market," and ſold it him at that price. He aſked how much there was of it; I told him about fifteen coombs. He marked the name, the quantity, and the price, upon the bulge of the paper, and the buſineſs was done.

His room was ſet round with farmers, who, the converſation being audible, were witneſſes to the bargain.

Another ſample I took to his mill; wiſhing to ſee the conſtruction and economy of a Norfolk mill;—and afterwards ſold him the remainder of the quantity; namely, about thirty coombs.

Not

80.
N. WALSHAM CORN-MARKET.

Not having received for the two former parcels, he desired I would give him a week's notice before I called upon him for the money. —Last week I gave him notice, and this evening I have been to receive it.

His room was full of farmers, smoaking their pipes, and drinking *punch*; excepting one, with whom he was doing business at a side-table.

My turn presently succeeded; and we agreed the account thus:

1782.

Jan. 10.	15 Co. 3 B's. "bare;" or 15 Co. full measure, at 21*s.* a coomb, or 21*l.* a last of 21 Co. - -		£.	15	15 0
26.	16 Co. 3.	at 21*l.* 10*s.*		17	2 11
Feb. 9.	15 Co. 3.	at 22*l.* 10*s.*		16	17 6
16.	14 Co. 3.	at ditto		15	16 1
	63 Coombs bare		£.	65	11 6
From which he deducted 1*s.* a last (of 21 Co.) for what he called "carriage," being a perquisite to his servants, - - -				0	3 0
			£.	65	8 6

Having received the amount, *signed a receipt*, and thrown down a shilling towards the liquor, the business was finally concluded.

81.

81.

81.

PLANTING.

FEBRUARY 28. Mr. A. Bayfield aſking me if I would not have ſome "wood layer" put into the places where the pollards (*oaken* pollards) were taken out againſt Suffield Common, I told him yes, he might have a little oak layer. "Why," ſays he, with his uſual coolneſs and good ſenſe, "would not a little aſhen layer think "you, Sir, be better? I have known aſhes thrive "rarely well after oaks, but have ſeldom known "oak layer take, where an oaken timber or "pollard has been taken down."

This is a valuable obſervation. It has long been obſerved, that an old orchard ſeldom bears planting as an orchard a ſecond time: nor is wheat after wheat, equal to pulſe or graſs after wheat; or wheat after pulſe or graſs.

82.

BREEDING SHEEP.

MARCH 1. In drawing off ſome mixt-breed hoggards for ſale, it is obſervable, that thoſe between long-wooled ewes and a Norfolk ram are handſomer ſtock, and forwarder, than thoſe which have been bred from Norfolk ewes by a Leiceſterſhire ram; and that in *this* caſe the ewes have always great difficulty in lambing.

83.

83.

83.

TURNEPS.

MARCH 2. Aſking a ſenſible intelligent farmer, who rears a large proportion of calves to the number of cows he keeps, how he gets milk for his calves, he anſwered, "turneps give the cows ſuch a fluſh of milk the calves ſeldom want."

COWS.

Turneps, he ſays, are fine things for cows: they ſcour and cleanſe them, and ſet them forward in the ſpring, when they come to be turned out to graſs; adding, that cows kept at dry meat, not only loſe their milk in winter, but the beſt part of the ſpring graſs is gone, before they get to the full of their milk.

This may be one reaſon why cows which have no turneps do ſo badly in this country; whoſe hay is dry and ſtrawy; and the graſs far from being of a ſucculent quality.

84.

BULLOCKS BREAKING TURNEPS.

MARCH 3. This morning I ſtood a conſiderable time to ſee ſome fatting heifers "break" their turneps. Being all at feed, they let me ſtand among them unnoticed; and having been about four months at the employment, they performed it with a dexterity, which afforded me conſiderable entertainment.

84.
BULLOCKS BREAKING TURNEPS.

In theory, it ſeems difficult for an animal, deſtitute of paws, and with teeth only in one jaw, to get to pieces a turnep, which he cannot contain in his mouth; more eſpecially when it is thrown looſe upon hard ground: one is led to imagine, that it would roll or ſlide away from him, as he attempted to bite it; but no ſuch thing happens. I ſaw ſeveral turneps begun and finiſhed without being moved an inch from the place they fell in from the cart. Had the bullocks been furniſhed with paws, or even hands, to hold them with, they could not have done it more dexterouſly.

Having ſmelled out a turnep they like, they preſs it hard againſt the ground with the gums of the upper jaw, applied upon the top of the turnep, toward the ſide which lies fartheſt from them, ſteadying it with the upper lip: then inſerting their teeth on the oppoſite ſide and biting ſomewhat upward, they take off a ſmall piece, proportioned, in ſome meaſure, to the ſize of the turnep. Having taſted the firſt bite, and ſmelt at the broken part, they take another ſlice; perhaps not thicker or larger than a crown-piece: and thus continue to take off, or rather ſcoop out, ſlice after ſlice until nothing is left but the tail of the turnep, and a ſhell

a ſhell of rind, in the ſhape of a fleeting diſh, and of a ſimilar thickneſs; carefully ſmelling, between the bites, at the part they intend next to take off. 84. BULLOCKS BREAKING TURNEPS.

The crown and upper part of the rind they eat, but ſeem ſtudiouſly to leave the tail, and the under part of the rind, which had ſtood in contact with the ſoil.

If a bullock break off a larger piece than he can gather up with his tongue as his head hangs downwards, he lifts up his head, and ſhoots out his noſe and neck horizontally, until he gets it between his grinders. Crowns, and very ſmall turneps, he treats in the ſame way.

This part of the buſineſs, however, he performs ſomewhat clumſily; and it is, probably, in this act that a ſmall turnep, or a piece of a large one, glancing from between the teeth, gets into the throat and cauſes ſufflation, or "choaking."

The tongue of a bullock is leſs flexible, and worſe adapted to the purpoſe of turning over and adjuſting a morſel of ſolid aliment, than are the tongues of carnivorous animals, or thoſe of the human ſpecies. The natural food of graminivorous animals is ſoft, and no way liable to ſlip from between the teeth in grind-

84. BULLOCKS BREAKING TURNEPS.

ing; their tongues being adapted to the purpose of gathering up their aliment, rather than to that of assisting them in chewing it.

85.

TIMBER.

MARCH 3. In thinning timber trees, whether in hedges, or in open grounds, it is generally advisable, when two trees grow amicably together, their branches intermixing, and their tops of equal height, forming as it were one top, to leave them both standing: for, if one of them be taken away, the beauty of the other is spoilt, and its atmosphere changed: the evil effect of this treatment I have frequently observed.

But when one of them has got the superiority so far as to overhang the other, it is generally right to take the underling away, and thereby add beauty and strength to the master-plant.

Twin timbers, however,—more particularly double stems growing from the same stub,—are dangerous to horned cattle. I have lately heard of more than one accident by trees growing so near together, that cattle could just get their horns through between them; and having got them there could not find the same way to ex-

extricate them; but falling down in the ſtruggle, were ſtrangled. I have ſince heard of a horſe being loſt in a ſimilar manner*. 85. HEDGE ROW TIMBER.

86.

MARCH 5. Mr. John Waller, of Antingham, ſhewed me today, ſeven ewes with fourteen lambs by their ſides: and a fifteenth, which he gave to his boy, is alſo alive. BREED OF SHEEP.

Laſt year he had nine lambs from three ewes; eight of which he actually reared, and are now alive; namely, ſix with the ewes, and two "cotts or "cotties" (a name for lambs reared by hand; a common practice here).

His ſheep are, in appearance, of the true Norfolk breed. He ſays he has had the breed eight or nine years, and they have ſeldom had leſs than two lambs a piece. *He keeps them well.*

The Norfolk ewes, in general, bring but one lamb.

* A ſtill more ſingular accident occurred to my own knowledge. A mare, probably in fighting with the flies, ſtruck her hind foot into a cleft between two ſtems of white-thorn, open at the bottom but narrowing upward; and being a high-bred, ſpirited mare, ſtruggled until ſhe tore her foot off; leaving it behind her in the cleft!

87. 87.

RENEWING HEDGES.

MARCH 5. When the hawthorn is dead thro' age or improper treatment, or from being overhung by trees or ſtubwood, it is difficult to get young layer to "take" in the old bank. There are two things againſt it; the dryneſs of the bank; and its having been already *cropped*.

Theſe two objections are in a great meaſure removed, with little inconveniency, or additional expence, by throwing the bank entirely down, about Michaelmas; letting it lie *fallow* all winter; tabling the new ditch the latter end of February; and putting in the layer, and finiſhing the fence, the beginning of March: for, by this means, the mould gets a thorough drenching, and receives the benefit of a winter's expoſure to the froſt and ſnow.

There are generally roots and ſtubs in an old ditchbank ſufficient to pay (in this county) for the labour of throwing it down; and the difference between making a new ditch and vamping up the old one, is not more than twopence a rod.

This Minute ariſes from a tenant's being deſirous to remake a ditch, which is loaded with ſtubwood of forty or fifty years growth; and which

87.

RENEWING HEDGES.

which has so totally destroyed the quick, that fresh layer would be wanted from end to end.

On examining the bank I found that, from the cover of the pollards and stubwood, it is, even now, as dry as chalk; and entirely occupied by roots and fibres of various sorts. I therefore advised him to let it remain until Michaelmas, and treat it in the manner above described.

He acceded to this the rather, as it is a plan which is far from being theoretical in Norfolk, being, I find, frequently practised.

88.

FURZE-HEDGES.

MARCH 5. Riding across Felmingham Heath, today, I observed a piece of new ditch-bank, out of the face of which young furzes were shooting, in the place where quicksets are usually put in; but without any being amongst them.

Looking round, I perceived that this was not a mere experiment; for the neighbouring hedges (of a sort of an encroachment) were of the same shrub; and many of them invulnerable fences; even against the heath stock. One which had been recently cut in the face (with a few left on the top as a blind) was as

88. thight as a wall. In general, however, they were getting much too old; ſome of them dying; and others thin at the bottom.

FURZE-HEDGES.

I am nevertheleſs fully convinced that a furze-hedge, *with proper treatment*, is, upon a light unproductive ſoil, a ſufficient and eligible fence.

89.

THATCH. MARCH 7. This morning, went to ſee *the method of cutting reed.*

The time of cutting reed does not commence until Chriſtmas; and continues till the young ſhoots begin to appear: the ſap is now beginning to riſe; the ſtems, below the water, being already green.

The cutters have a boat to carry them from the banks to the "reed-rond;" which, in this caſe, lies at a ſmall diſtance from the ſhore.

Some they cut ſtanding in the boat; ſome ſtanding on a plank, laid partially, or wholly, upon the mud and roots of reed, matted intimately together.

The workmen cut it upwards, gathering the reed in the left hand and arm, underhanded, with ſickles (reaping hooks are too ſlippery for the reed) as much below the water, conſequently

quently as near the root, as may be; it being an idea, even unto a proverb, that one inch below the water is worth two above it; for the part which now appears green changes to a blackiſh brown, and becomes as hard as horn; whereas that which grows above the water is brittle, and of a more periſhable nature. 89. CUTTING REED.

Having encumbered their boat, they puſh it to the ſhore, and make up the reed into ſheaves, (with thumbands made of ſtraw) of ſuch a ſize that five of them will make a fathom of ſix feet in circumference (ſometimes the ſheaves are made ſix to a fathom): ſixty of thoſe fathoms are a load; and a hundred and twenty are termed a hundred of reed; worth about three pounds.

The matts of roots frequently ſeparate in cutting the reed, and float about the water, ſtill propagating reeds in ſmall clumps; not larger, perhaps, at firſt than the top of a buſhel.

This ſeems to be the ſpeedieſt way of propagating reed; namely, ſeparate the beds of roots; drag them to different parts of the water; and faſten them with ſtakes, until the roots get hold of the bottom. PROPAGAT. OF REED.

The ſtarlings have done conſiderable damage to this patch of reed: the outſides look fair;

89 STARLINGS ENEMIES TO REED.

fair, but the infides of the clumps are very much broken down, by their rooſting among it; more particularly while it was green, before it had received a firmneſs of ſtem to bear them. I have ſeen thouſands at once light among it. In the fens, the reedmen are great enemies to theſe birds; and (if one may judge from the proportional damage they have done in Suffield pond) with great reaſon.

90.

HEDGES.

MARCH 8. I have at length nearly finiſhed ſetting out this year's wood and ditching.

In the courſe of the ſeaſon, I have made the following obſervations, and have endeavoured to adhere to the following rules, reſpecting timber trees and pollards in hedges.

HEDGE ROW TIMBER.

In regard to TIMBER TREES, however, I have not been able to purſue entirely the line of conduct I have laid down, from this and laſt year's experience: it may, nevertheleſs, be right, while the ſubject is full and freſh in my mind, to minute my preſent ideas on this important department of rural economy.

I am clearly of opinion, that all ſuch timber trees as are now decaying; *alſo* ſuch as are full-grown, though not yet decaying, but are ſo ſituated as to overhang or otherwiſe

crowd

crowd the neighbouring ſtands or timberlings, or the young timber trees which are in a more youthful and growing ſtate; *alſo* ſuch part of the growing timbers themſelves, as, by ſtanding too cloſe, crowd and check each other, ſhould be marked, and ſold at the preſent market prices; though theſe prices may be ſomewhat below par. 90. HEDGE ROW TIMBER.

For, if to the intereſt of the money, which would ariſe from ſuch ſale, be added the decreaſe of value, or the injury incurred by ſuffering timber of the above deſcription to remain ſtanding, the proprietor of ſuch timber is loſing annually from five to ten per cent. of its preſent value, by ſuch improper conduct. Thus ſuppoſe an eſtate has five thouſand pounds worth of timber upon it, bearing the above deſcription; its proprietor is loſing from three to five hundred pounds a year by ſuffering it to remain ſtanding.

Whenever the price ſhall hereafter riſe to what may be eſteemed a fair felling price, then, but not till then, falls ought to be made of all *full-grown* timbers; *alſo* of ſuch growing trees as, from their ſituation, are, or may ſoon become, injurious to each other. Much, no doubt, depends on embracing the lucky moment of ſale; nevertheleſs, perhaps, more money

90. money has been loſt than gained, by ſpeculating nicely in this delicate matter.

HEDGE ROW TIMBER.

The dead wood and hanging boughs of all timber trees left ſtanding ought to be removed; and the younger timberlings trained in ſuch manner as will induce them to take the deſired outline, and riſe in the moſt profitable form. Oaks, in hedges, naturally grow low and ſpreading, doing more injury to the hedge and the adjoining incloſures than their own value, in that form, can ever repay; whereas tall well headed oaks are at once ornamental and valuable to an eſtate;—without being, in any conſiderable degree, injurious to the occupier.

Being fully convinced of this, from almoſt daily obſervation, I am clearly of opinion, that every opportunity ought to be taken to propagate oaks in hedges; not by putting in young plants where old trees have been taken down; but by ſearching for, and preſerving, young ſeedling plants (more eſpecially where a hedge is cut down), and carefully training them up wherever a vacancy will admit them:—Or, if ſuch do not riſe naturally, by putting in tranſplanted plants in vacant hedgebanks and waſte corners; at the ſame time dibbling acorns round them, in order that, in the courſe of a

few

few years, the woodman may have his election of the propereſt plant to be trained. 90. TIMBER.

This however is not the buſineſs of a day, nor of one year, but requires an annual attention; embracing convenient times, and favorable opportunities, as the buſineſs of the eſtate is proſecuted; conſidering this as one of the moſt material objects belonging to its management.

With reſpect to the POLLARDS, I have followed theſe rules:— HEDGE ROW POLLARDS.

Such as were not likely to throw out, in twenty or twentyfive years, a top equal to the preſent value of their ſtems, I valued to the tenants as fire-wood.

Thus ſuppoſing the body of an old pollard to be worth, as firewood, two ſhillings; but from the appearance of the preſent top, when compared with thoſe of the neighbouring pollards, it was not likely to throw out, in twenty or twentyfive years time, another top of two ſhillings value, I marked it to come down, and charged the tenant two ſhillings for it, over and above the value of its preſent top: for the intereſt of the money will, at the end of that time, be more than the topwood would have been had it been left ſtanding; beſide the mould-

90.
HEDGE ROW POLLARDS.

mouldering and waſte of its own body, and the incumbrance it would have been to the eſtate.

Such, alſo, as ſtood particularly in the tenant's way, or which crowded a young ſtand or timber, or where they ſtood too thick, I took down, valuing them to the tenant as firewood; but with this invariable proviſo, that if, on cutting off their butts, they proved ſound, they were to be taken for the uſe of the landlord; the tenant having a deductory allowance made for the quantity of firing blocks ſo taken.

Alſo, if a pollard, of a proper ſize, appeared to be at preſent ſound enough for a gatepoſt (more particularly if gatepoſts were wanting upon the farm they ſtood on), but which from its preſent appearance it would not be at the time the ditch would want to be made the next time, I marked it to come down:—for a good hanging-poſt is worth five ſhillings; whereas a firing pollard of the ſame ſize is not worth more than one ſhilling.

But ſuch thriving pollards as did not ſtand particularly in the way of the fence or the tenant, and ſuch as were not wanted for any particular uſe; alſo ſuch as were likely to throw out another top, and ſtood well upon the bank, ſo as not to injure materially either the tenant

or

or the fence, I invariably left ſtanding: for, although coals may at preſent be plentiful, and coaſting-veſſels ſufficiently numerous, and have an unobſtructed paſſage from Newcaſtle to Cromer; yet who can foreknow the revolutions in nature and nations which may hereafter take place? and who will be hardy enough to ſay that Eaſt Norfolk cannot experience a want of materials for firing? The face of the country is no doubt at preſent too much encumbered with pollards, to the great inconveniency of its preſent occupiers: but it may be well to leſſen their number with a prudent hand; leſt, by ſweeping them away indiſcriminately, we may entail on poſterity a ſtill greater inconveniency.

90. HEDGE ROW POLLARDS.

91.

MARCH 14. On Monday evening laſt, about eight o'clock, the wind roſe very high; blowed hard all night; continued blowing all day on Tueſday; and in the evening blew a violent gale. REPAIRS.

There

91.

REPAIRS. There has ſcarcely one thatched roof upon this eſtate eſcaped, entirely, its fury. Many of them however are only ruffled; but great numbers (an hundred at leaſt) are broken, more or leſs; ſome of the breaches conſiderable: while the tiled roofs have eſcaped without any conſiderable injury.

Had the practice, propoſed in MIN. 63. been adopted a few years ago, perhaps not a breach would have happened; for where the roofs have been overlooked in the courſe of the laſt year, even the thatched ones are hardly ruffled; whereas, in the ſtate in which ſeveral of them ſtill remained, there is three or four months work of a thatcher to repair them.

THATCH. Reed in particular ought to be driven or relaid whenever it begins to ſlip, or the bindings begin to decay:—it is the reed roofs in general which have ſuffered.

REED. There is one advantage in reed, however; it may moſt of it be gathered up and relaid.

92.

REPAIRS. MARCH 14. The bricklayer and thatcher employed upon this eſtate live at a diſtance.—

This

92.

REPAIRS.

This inconveniency I have frequently experienced, but never so much as now, when such a number of petty, but exigent, jobs have been created by the late high winds:—the tenants are solicitous to have their furniture and their corn secured from the wet, and I cannot give orders to the thatcher or bricklayer without riding or sending two or three miles to them, or their coming as far out of their way to me.

GEN. MAN. OF ESTATES.

Upon a large estate, a master or foreman carpenter, master bricklayer, thatcher, and blacksmith, ought to live in the immediate neighbourhood of the manager.

93.

BULLOCKS AT TURNEPS.

MARCH 16. Since the late severe weather set in, it has been remarked that bullocks abroad have done unusually ill; while those in sheds have done well. (See MIN. 69.)

Are not these sufficient hints to farmers, to keep their bullocks abroad in warm weather, and take them up, or at least par them, in severe weather? While they are buds and two-year-olds, they are nursed in a warm well-kidded paryard; but, at a time when they are en-

93. BULLOCKS AT TURNIPS.

titled to every indulgence the farmer can give them, they are expoſed to the weather, be it ever ſo inclement; with ſcarcely a hedge to ſhelter them: their only ſhelter being, too frequently, nothing better than a row of naked "buck-ſtalled thornen bulls."—No wonder, then, that after the remarkably mild weather we had, at the beginning of winter, the late ſudden change ſhould give a check to ſuch as have been expoſed abroad*; deſtitute of ſhelter, and, conſequently, deſtitute of that temperature of *mind* as well as of body, which, *perhaps*, is eſſential to their thriving.

Mr. Cook, of Felmingham, whoſe opinion in this caſe is valuable, corroborates theſe obſervations; ſo far, at leaſt, as they relate to the temperature of the body. A good lodging, he ſays, is a great thing to a bullock:—his expreſſion was, "it keeps them warm within; "and when they get up they ſtretch them-"ſelves, ſhooting out their hind legs as if "they meant to leave them behind in the par-"yard."—Whereas after having lain upon the cold ground, more eſpecially if it be *wet*, "they become cold on the inſide; and, on "riſing, ſtick up their backs, with their four

* Homebreds are here ſpoken of.

"feet

" feet drawn together, as if they were afraid to " move them from the place they ſtand in." Cold weather, he ſays, no doubt checks bullocks which go abroad very much; more eſpecially if it be *wet*; adding, that " if their *backs be dry* " they do not ſo much mind the cold." 93. BULLOCKS AT TURNEPS.

94.

MARCH 25. AYLSHAM FAIR. This ſeems to be a fair appropriated to dealings between farmer and farmer, rather than to drovers and profeſſional dealers. It is chiefly noted for plow horſes; which, at this ſeaſon of the year, become valuable to the Norfolk farmer; every hand and hoof becoming buſily employed againſt barley ſeedtime. It is, however, upon the whole, a ſmall fair; and the fairſtead uncommonly ſmall and incommodious. MARKETS.

Today the number of cattle were very few: not more than one hundred head in the fair: and thoſe, in general, of a refuſe kind. CATTLE.

It ſeems to be a fact, univerſally underſtood, that the quantity of ſtock in this county has, of late years, very much declined. There have, it is generally allowed, been fewer young cattle reared of late, than there were formerly: owing, it is thought, to the lowneſs of price;

94. FAIR OF AYLSHAM.

arising probably from a scarcity of money, and from the failure of the turnep crops, for some years back.

CATTLE.

The few which were in the fair today, seemed principally to consist of such as had been at turneps; and had got a little fleshy; but still required a considerable time, and good keep, to finish them. There were also a few cows and calves, and a little young stock.

HORSES.

The number of horses was considerable (perhaps a hundred) set up against rails, placed on a rising ground, to shew their forehands to advantage. Ten to twelve pounds the highest prices; even for young horses.

95.

PLANTING.

MARCH 26. This morning marked out the weedling plants of a plantation, made by the late Sir William Harbord, twentyfive to thirty years ago *.

It consists of the following species of trees:—

Oaks,	Scotch Fir,
Ash,	Larch,
Beech,	Alder,
Chesnut,	Hornbeam.

* On counting the rings of different species, I found the number to be thirty or thirtyone.

The

The *Scotch fir* has outgrown every other ſpecies; and the plants, though few, are become a burden to the grove. The wood being of quick growth, the plants have not only outtopped the reſt, but have, in general, had time enough to furniſh themſelves with boughs on every ſide; ſo as to cripple the beautiful oaks and beeches which ſtand near them. If, therefore, Scotch firs be planted in a grove, by way of variegation, they ought to be kept trimmed below; which would check their growth, and in ſome meaſure prevent their doing miſchief: but, even with this reſtriction, they ought to be admitted into ſociety with a ſparing hand. 95. PLANTING.

The *larches*, too, where they ſtand free from the Scotch firs, are of a conſiderable ſize; but they are not equally miſchievous with thoſe; their boughs being leſs extenſive, and more rotted off below: they are, nevertheleſs, injurious to their leafy neighbours. Where they ſtand thick, among the firs, they are drawn up ſtrikingly tall and ſlender, or are ſo much overhung as to be crippled, or entirely ſmothered. —Marked great numbers that were dead or dying.

The *oaks* are many of them beautiful plants; but are either entirely crippled by the firs and

95. PLANTING. larches, or, where there is any head-room, are drawn up much too tall and ſlender.

The ſame may be ſaid of the *beeches*; and it is curious, though painful, to ſee how they ſtruggle for the light, wherever they can *ſee* a peep hole.

The *aſhes* too, where they ſtand among the firs and larches, are either ſmothered outright, or are drawn up much too tall and ſlender. In a part where they ſtand alone, without any admixture except a few alders, there are ſome moſt beautiful plants.

The *cheſnut*, if one may judge from this inſtance, is totally unfit for a miſcellaneous grove. There is ſcarcely one of this ſpecies enjoys the ſmalleſt portion of ſunſhine: the few which ſtill exiſt are chiefly undriſing; and ſome of them not much larger than when they were planted.

It muſt be obſerved, however, that much may depend on the *ſoil*. This plantation divides a rank moory meadow from a good, ſound, upland ſoil; ſome parts of it partaking of the former, ſome of the latter quality.

The larches and the cheſnuts, obviouſly, do beſt on the dry ſoil. The Scotch firs, too, ſeem to have gone off upon the moory ſoil; there

95. PLANTING.

there being ſome, but very few, left upon it; and thoſe coarſe and ſtunted. The aſhes do remarkably well on the moory parts. In one particular place; not the wetteſt; there is a parcel of perhaps the moſt beautiful plants that ever grew—their ſkin as ſmooth and clean as that of the beech; and, though not more than twenty-one inches in circumference, they are not leſs than forty feet in height; and as ſtraight as gun-barrels. The oaks, beeches, and a few hornbeams, thrive wherever they have been planted, and can get their heads out. They do not, however, ſeem to have been planted on the very wet parts.

The largeſt of the firs meaſure in circumference, at five feet high, - 39 inches.

Larches,	- -	36
Cheſnuts,	- -	28
Beeches,	- -	32
Alders,	- -	32
Aſhes,	- -	21
Oaks,	- -	28
Hornbeams,	- -	—

The greateſt collective height of the plantation is about forty feet.

This plantation furniſhes a ſtriking inſtance of the miſchiefs enſuing from the want of a proper attention to infant groves.

95.
WEEDING PLANTATIONS.

In this caſe, judicious thinnings would, evidently, have been highly advantageous. Great numbers of plants have periſhed, and come entirely to waſte; and, of the two hundred and eighty which I have now marked, one hundred are dead, or nearly ſo.

This, however, is the ſmalleſt ſhare of the loſs; for thoſe ſtill remaining are drawn up too tall and ſlender; and with tops too ſmall and inſignificant, to make due progreſs towards large timber-trees.

In point of *profit*, the beſt method now to proceed by would be, to take down all, or the greateſt part of the Scotch firs; trimming up the few, which perhaps might be left with propriety; and thinning very conſiderably, *but by degrees*, the larches, and ſuch of the other ſpecies as might require it.

But, in point of *ornament*, this, for a few years, might be injurious: however, in the end, both ornament and utility would, beyond a doubt, be increaſed by it; and the immediate acquiſition of materials for repairs would be very conſiderable.

How many entire roofs of cottages, leanto's, and other out-buildings; and what a ſupply of rails, common ladders, and rough ſcantling might

might be drawn from this ſmall plantation: enough to keep the common buildings of the eſtate in repair for ſome years: and this, too, with a trifling expence of ſawing compared with that which is neceſſary to the reduction of grown timbers into ſmall ſcantling *.

95. WEEDING PLANTATIONS.

96.

April 3. Spent the afternoon with the Rev. Mr. Horſeley, of Swayfield; and walked with him over his improved meadows. MEADOWS.

They are the only meadows in the county (at leaſt that have fallen under my obſervation) which have been managed with any degree of ſpirit or judgment.

Mr. Horſeley ſays, that when he purchaſed them (ſome eight or ten years ago) they were a mere moraſs: ſo very rotten that it was difficult even for a man to walk acroſs them; producing very little herbage ſuperior to ruſhes and moſs. They are now (even after this uncommonly wet ſeaſon) firm enough to bear the largeſt cattle; and are covered with a turf equal in appearance to the richeſt graſsland.

* I flatter myſelf no apology is neceſſary for the length of this Minute: planting is an important branch of rural affairs; and it is in tall plantations, rather than in the nurſery, we ought to ſtudy the great principles of the art.

Mr.

96. MEADOWS.

Mr. H.'s plan of improvement was this:—Having lowered a rivulet, which runs through them, ſo as to ſink the ſurface of the water about four feet below the ſurface of the meadow, he cut drains, ſeven feet wide, and four feet deep, *parallel to the rivulet*; and, with the excavated mould, filled up the ſmall drains which had formerly been cut; and levelled the other inequalities; ſo as to render the ſurface ſmooth and even.

Theſe drains were at firſt made at about twenty or thirty yards diſtance from each other; but Mr. H. is now filling the major part of them up; they having performed the office of laying the ground dry; and he is of opinion, that the rivulet and the fence-drains, alone, will be ſufficient to keep it ſo.

Theſe meadows conſiſt of eighteen acres; divided at preſent into four "ſhifts," by the rivulet and two parallel main drains; which are barely ſeven feet wide: but the cattle ſometimes attempt them; and eight feet—ſay half a rod—is the leaſt width that fence-drains ought to be made.

The ruſhes were ſubdued by the ſithe, the moſs by manure, and the herbage improved by the ſweeping of the hay chamber ſcattered on, in

96.
GRASSLAND MANAGEM.

in the ſpring. Neither the harrow, nor the roller, has yet been introduced.

Mr. H.'s method of treating his meadows, now in their improved ſtate, is to paſture them every year, and to ſhift his ſtock repeatedly; beginning at one end, and proceeding regularly, ſo as to make two or three revolutions in the courſe of the ſummer: and, whenever he takes his ſtock out of one of his pieces, he makes a point of ſweeping down the weeds and rough graſs. An admirable practice; by which a freſh rowen-like bite is prepared againſt the return of the ſtock; beſides the weeds being thereby effectually kept under.

Mr. H. ſays, that he has fatted both ſheep and bullocks on this improved moraſs; and that they fat very kindly. He further ſays, that it gives cows a great flow of milk; and Mrs. H. that the butter from it is perfectly good.

Enquiring of Mr. Horſeley, if he had kept an account of his expences ſince his firſt purchaſe; he ſaid, no; but was clear in the main fact; namely, that the improvement greatly exceeds the expence of improving: adding, that he could have ſold the land, in its improved ſtate, for twice the amount of the purchaſe-money.

96. MEADOWS. money. It has every appearance of being now worth from twenty to twenty-five ſhillings an acre.

97.

BULLOCKS AT TURNEPS. APRIL 14. I have given particular attention to the management and progreſs of the two lots of bullocks, which I was preſent at the buying of, at St. Faith's fair. (See MIN. 27.)

It is a ſtriking and intereſting fact, that, notwithſtanding there was only fifteen ſhillings a head difference, in the purchaſe-money of theſe two lots, there is not leſs than forty ſhillings a piece difference in their preſent value.

A great advantage, no doubt, ariſes, to a judge of cattle, from having the choice of a drove; drawing out only a few of the head bullocks. But in this caſe the drove was ſmall; and I remember Mr. B. was dubious in his choice of the laſt two or three of his lot: the diſparity, therefore, at the time of purchaſe was not very great; being, in ſome individuals, ſcarcely perceptible to the eye of a judge.

From theſe and other circumſtances, I am convinced that much depends upon the *management* of bullocks at turneps, as well as upon

upon judgment in purchaſing them: for, of ſeveral parcels of fatting bullocks, which I have had an opportunity of making my obſervations upon, this winter, none have done equally to Mr. B.'s lot of heifers. 97. BULLOCKS AT TURNEPS.

His turneps, no doubt, are good; and ſo are thoſe of many of his neighbours; and the ſuperiority of management appears to lie in letting them have plenty of freſh turneps; with plenty of followers: and in their being regularly ſhifted every day.

98.

APRIL 14. What a trifling expence of labour has been incurred by ——— farm, from Michaelmas 1780, to Michaelmas 1781. GEN. MAN. OF FARMS.

It contains near four hundred acres of arable land; with about fifty acres of meadow.

The whole expence of workman's wages, the harveſt month included, is no more than - - - £. 186 2 7½

To which muſt be added, the bailiff's ſalary - 35 0 0

£. 221 2 7½

Thus the whole expence of labour and houſekeeping (for the bailiff and all the men boarded themſelves and drank their own beer) is not nearly

98.

LABOUR. nearly equal to the rent of the land: for this farm, if freed from game, is worth from two hundred and fifty to three hundred pounds a year.

RENT. A farm of the same magnitude in Surrey or Kent could not have been managed for twice the money. And this accounts for the high price which land bears in Norfolk. Land which lets here for fifteen shillings an acre, would not in Surrey or Kent (at twenty miles distance from London) let for more than half the money.

LABOUR. The lowness of wages; the quick dispatch of business; and, most especially, the practice of plowing with two horses, and going two journies a day; account in a great measure for the disparity.

SOIL PROCESS.

99.

SHEEP. APRIL 16. The shepherd telling me that a cutter in the neighbourhood could extract the concealed testicles of ridgil lambs; and he having last year experienced the inconveniency of three or four of these troublesome and dangerous animals, I let him send for him. This morning he has cut three; the whole number, it seems, this year. They are now from six to eight weeks old.

Having

99.
CUTTING RIDGIL LAMBS.

Having cut off the end of the bag, and drawn the teſticle contained in it, he proceeded to take the other out of the ſide oppoſite to that on which the palpable teſticle lay*.

The lamb was laid flat on its ſide, upon the ground; one man holding it by its neck and fore legs; and another ſtretching it out, by drawing its hind legs back; both of them at the ſame time preſſing their hands hard to the ground; ſo that the lamb had no liberty to ſtruggle.

The cutter then clipt off a patch of wool, about the ſize and ſhape of a duck's egg, cloſe below the loin, and about half way between the huckle and the ſhort ribs.

He then made an inciſion, wide enough to admit, freely, his fore finger; with which he ſearched for the ſtone, and preſently brought it out; and, diſentangling it very dexterouſly from the film with his knife, drew out the ſtring.

He immediately ſowed up the orifice, and coated over the wound with cart-greaſe.

* It increaſes the difficulty in cutting ridgils, when the palpable teſticle has been priorly extracted; as the operator, then, knows not which ſide to cut on; and is frequently obliged to cut both ſides before he finds the concealed teſticle.

It

99.
CUTTING RIDGIL LAMBS.

It is remarkable that the concealed teſticles all lay on the ſame ſide; namely, the right ſide; the contrary ſide to that on which females are cut. This made the operation rather awkward to his hand; he nevertheleſs performed the buſineſs ſo ſkilfully, and with ſo much dexterity, that he extracted the two firſt in a few minutes. But the laſt was a remarkably difficult caſe; the teſticle being very ſmall, and braced up cloſe to the vertebræ; and it is obſervable, he could ſcarcely draw the palpable teſticle of this lamb out of its bag: the puniſhment to the animal ſeemed full as much in one operation as the other.

The price of cutting, a ſhilling a piece.

APRIL 22. The wind being cold, kept them in the houſe all night:—but the cutter, though the wind continued very pinching, thought it proper for them to go out in the daytime for the ſake of exerciſe: they got very ſtiff for ſome days, but are now doing very well.

APRIL 30. One of them, nevertheleſs, is ſince dead:—owing, I apprehend, entirely to their being too much expoſed to an unuſually piercing eaſterly wind.

100.

100. 100.

April 20. There is an alertneſs in the ſervants and labourers of Norfolk, which I have not obſerved in any other Diſtrict. WORKMEN.

That "cuſtom is ſecond nature" is verified every hour. How quick and alert are the tradeſpeople and handicraftmen in London! They will diſpatch as much buſineſs in a given time, as the very ſame people, had they been bred in ſome parts of the country, would have done in twice that time. The caſe is ſimilar with the Norfolk huſbandman. While a boy, he is accuſtomed to run by the ſide of the horſes while they trot with the harrows.—When he becomes a plowman, he is accuſtomed to ſtep out at the rate of three or four miles an hour: and, if he drive an empty team, he either does it ſtanding upright in his carriage, with a ſprightlineſs of air, and with a ſeeming pride and ſatisfaction, or runs by the ſide of his horſes while they are bowling away at full trot.

Thus, both his body and his mind become active: and if he go to mow, reap, or other employment, his habit of activity accompanies him;—and is obvious even in his air, his manner, and his gait.

100.
WORKMEN.

On the contrary, a Kentiſh plowman, accuſtomed from his infancy to walk, whether at harrow, plow, or cart, about a mile-and-a-half or two miles an hour, preſerves the ſame ſluggiſh ſtep, even in his holidays; and is the ſame ſlow, dull, heavy animal in everything he does.

That the Norfolk farm-labourers diſpatch more work than thoſe of other countries is an undoubted fact; and in this way, I think, it may be fully accounted for.

101.

MARKETS.

MAY 4. Went this morning to ſee the *clover-ſeed market* at Norwich.

The ſeeds are brought chiefly from Suffolk, and the Suffolk ſide of Norfolk. Many of them are in the hands of the growers themſelves; ſome in thoſe of jobbers, who collect them of the farmers. They are principally contained in coomb ſacks, containing four buſhels, of ſixtyſix pounds each, together with two pound a buſhel for over-weight; ſo that a buſhel is only a term uſed for ſixtyeight pound of clover ſeed, at Norwich market: or for ſixtyſix pound, in other parts of the county.

The ſeeds are principally brought into market in theſe coomb ſacks; in which ſeveral hundred

101.

CLOV. SEED MARKET.

hundred buſhels may be ſeen ſtanding: and in the middle of the market are a pair of large ſcales, adapted to the weighing of a whole ſack, or a leſs quantity; the farmers paying ſo much a draft for the uſe of them.

Beſide what are thus brought into market, the dealers have quantities at their reſpective warehouſes*; and great quantities are alſo ſold by corn merchants, and even bankers, by ſample. Indeed, at this ſeaſon of the year, almoſt every man of buſineſs, who has got a little looſe money, is a dealer in clover-ſeed.

The market, however, does not conſiſt wholly of red clover-ſeed:—there are proportional quantities of "ſuckling" (white clover); alſo of "hulled Nonſuch" (trefoil); alſo of "black Nonſuch" (trefoil in the huſk); alſo of "white Nonſuch" (darnel or ray-graſs); and of "black and white Nonſuch;" namely, a mixture of the two laſt ſorts.

* One Cunningham is by much the largeſt dealer: he lives near Harleſtone: and buys up his ſeed in that neighbourhood, and in Suffolk: Enquiring as to the quantity ſold, I was told (in the afternoon) that he had ſold, in the courſe of this day, a hundred coomb of clover-ſeed!—thirty or forty coomb of it, however, were to country dealers.

101.

CLOVER-SEED MARK.

The prices, more particularly of "clover," (that is, red clover) are very fluctuating: laſt year, prime ſeed was bought from eighteen to twenty ſhillings a buſhel. It has been known ſo low as fifteen ſhillings; and three pounds ten ſhillings a buſhel has been given in this market.

Today, the prices were as follow:

Clover, twenty ſhillings to thirty ſhillings a buſhel.

Suckling, ſixpence to eightpence a pound.

Darnel, twelve to fifteen ſhillings a coomb.

102.

BULLOCKS AT TURNEPS.

MAY 4. A fortnight ago, Mr. ——— ſent twelve of his Scotch heifers, bought at St. Faith's, (ſee MIN. 27. and 97.) to Smithfield.

Today, he ſhewed me the ſaleſman's account.

They ſold from eight pounds five ſhillings to eleven pounds a piece—the neat proceeds a hundred and ten pounds, or nine pounds five ſhillings a head. They coſt ſix pounds fifteen ſhillings; ſo that they left a profit of about fifty ſhillings a head.

They were at turneps about twentyfive weeks; and conſequently paid no more than two ſhillings a week for their keep, notwithſtanding the preſent high markets.

They

They were not highly finiſhed; but turneps being almoſt done, and graſs backward, the proprietor of them judged wiſely in ſelling off the beſt of them now, that he may be able to finiſh the remainder the more highly with graſs. 102. BULLOCKS AT TURNEPS.

103.

MAY 5. The late beating rains have waſhed down the face of many hundred rods of ditching. New-raiſed ditches have ſuffered moſt; but where the face looked to the north-eaſt, ditches which have been made even two or three years, have ſuffered conſiderably. RAISING HEDGES.

Where new ditches have been raiſed this ſpring, in the Norfolk manner; namely, very upright, with the layer planted almoſt at the top of the bank; much miſchief is done; for not only the face, but the layer alſo, lies by the heels in the "holl," for many rods in a place: and this, it ſeems, is a misfortune not uncommon in Norfolk; yet ſtill the farmers perſiſt in raiſing their live fences in this moſt injudicious manner.

I have the ſatisfaction to ſee thoſe ditches which I raiſed laſt year, with an offset, and with the layer planted on the firſt ſpit, all

105. RAISING HEDGES.

ſtanding: indeed, ditches raiſed in this manner, cannot readily take eſſential hurt by beating rains; for ſhould either the foot or the upper part of the facing ſhoot, the layer is ſtill ſafe.

It is the cuſtom here to oblige the ditchers to make good the breaches of the firſt year, gratis. This, however, if the work was properly done, is this year rather hard upon them. But be this as it may, there needs not a ſtronger proof of the frequent *miſcarriages* of Norfolk ditches than this cuſtom.

104.

May 5. It ſeems to be a growing practice, in this country, to ſow furze-ſeed on the backs, or rather upon the tops, of ditchbanks.

There is, however, one great evil attends it, when ſown upon the top; for growing quicker than the hawthorn, the furze, in a few years, over-hangs, and ſmothers the young hedgeling; eſpecially if it be neglected to be cut down, or trimmed off on the face ſide: a work which is too often, and, indeed, almoſt univerſally neglected.

But if the ſeeds be ſown upon the *back* of the bank, this evil is in a great meaſure prevented;

vented; and the furze being principally intended as a defence of the back of the bank from cattle, it is extraordinary that the cuſtom of ſowing it upon the top ſhould continue. 104. RAISING HEDGES.

Laſt year, I ſowed upwards of a hundred rods, and this year about two hundred: my method has been this.

Two men, with a ſpade, a broom, and a common glaſs bottle, furniſhed with a perforated ſtopper*, proceeded thus: the firſt man chops a drill with his ſpade, from two to three inches deep, and at about two-thirds of the height of the bank. In this fiſſure the other man ſcatters the ſeed through the hole in the cork, at the rate of thirty long rods to a pound of ſeed. This done, one of them, in order to repair the cracks and partial breaches made on the bank by chopping the drill, pats it with the back of his ſpade above and below the mouth of the drill, which is purpoſely left open; while the other, with the broom, ſweeping upwards over the mouth of the drill, covers the ſeed with looſe mould; yet leaves the SOWING FURZE-SEED.

* A wooden cork, pierced with a gimblet, about the ſize of a ſwan's quill; the inſide burnt ſmooth with a wire, and the outſide bound with thread to make it ſtick ſecurely in the mouth of the bottle.

1794. SOWING FURZE-SEED.

mouth sufficiently open to permit the young plants to make their way easily out of it; and to catch the rains which trickle down the upper part of the bank*.

Two men will sow 120 rods a day	0	2	4
Four pounds of seed, at 15d.	0	5	0
	£.0	7	4

Somewhat more than one halfpenny each statute rod, for seed and sowing.

HEDGE WOODS.

On light sandy soils, in which the furze generally thrives abundantly, but where white-thorn, if the soil be barren as well as light, is an age in coming to a hedge adequate as a fence, the furze is the most eligible shrub to be propagated singly; and in every soil in which the plants will thrive, it is an excellent guard to the back of the ditch, forming a much warmer shelter for cattle than white-thorn, or any other deciduous shrub, owing to its numerous branches and leaves; more especially

* The shooting of the bank is the only thing to be feared in this case; it ought not therefore to be made too steep; and ought at the time of making, to be sowed with grass-seeds. (See HEDGES, Vol. I.)

if

if theſe be increaſed by timely cutting; or, which is much preferable, by trimming off the ends of the branches.

104. SPECIES OF HEDGE WOOD.

The almoſt only inconveniency of a furze hedge, is its becoming liable to be killed by ſevere froſt. It is probable, however, that a hogged hedge would ſtand the froſt better than one which is ſuffered to overgrow itſelf, and expoſe its roots and ſtems to the inclemency of the weather: even ſhould a hogged hedge be killed to the root, it ſeems probable that thro' the numerouſneſs and compactneſs of its ſtems and branches, it would remain a ſufficient dead hedge, until another live one might be raiſed from freſh ſeed.

Another inconveniency of a furze hedge is, in theory at leaſt, its ſhedding its ſeed, and over-ſpreading the adjoining land. This inconveniency, however, I have not ſeen in Norfolk: and I believe is not to be apprehended, if "French ſeed" (which may be had of any ſeedſman in London) be ſown.

105.

105. 105.

MARKETS. MAY 8. WALSHAM FAIR.—This fair, which is held the Wednesday fe'nnight before Whitſunday, is a conſiderable fair for fat bullocks; alſo for cows and calves, and young ſtock.

The cattle begin to come in about ſeven, and continue coming until nine or ten; the fairs as well as the markets of Norfolk being held late in the day.

There were ſeveral hundred head of cattle at Walſham today, and had they been collected into *one* fairſtead, would have made a good ſhow.

The principal buyers were the Norwich, the Wells, and the country butchers; alſo ſome dealers for the London and St. Ives's markets; and probably ſome under-finiſhed bullocks were bought, by thoſe farmers, who had graſs and money, of thoſe who were in want of both.

I ſaw a ſteer and a heifer, good meat, and weighing about ſeventy ſtone the two, ſold for ſixteen pounds eight ſhillings, which is more than four ſhillings and eightpence a ſtone.

Alſo

105.
FAIR OF WALSHAM.

Alſo two large, but not fat, ſteers, weighing together about one hundred ſtone, ſold for twenty pounds ten ſhillings, which is only four ſhillings and a penny a ſtone.

Alſo ſix two-year-olds, good meat, but not finiſhed, and weighing about thirty ſtone each, for ſix pounds twelve ſhillings a head; about four ſhillings and five-pence a ſtone.

Cows and calves, in good demand; ſold from three to ſix pound.

Lean two-year-olds worth from fifty ſhillings to four pound.

Yearlings (now near eighteen months old) from forty to fortyfive ſhillings.

BULLOCKS AT TURNEPS.

It is notorious, that there are very few *fat* bullocks in Norfolk this ſpring; owing, it is ſuppoſed, to the unkindlineſs of the weather, and to the bad quality of turneps, which, it is ſaid, are this year thicker-ſkinned, and of a weaker quality, than uſual.

There were not twenty "right fat" bullocks in the fair: the few that have been finiſhed this ſpring have been ſent to London; the markets there having been very good.

Bullocks ſold, laſt Monday in Smithfield, for upwards of five ſhillings a ſtone, and they have not fetched leſs than that price for ſeveral

105. SMITHFIELD MARKET.

ral market-days laſt paſt. But Smithfield market is a lottery; and, I apprehend, four ſhillings and ſixpence at Walſham is a better price (charges and riſque of road and market conſidered) than the *chance* of five ſhillings in London.

106.

DISTRICT.

MAY 12. On Friday morning ſet out in company with Mr. John Baker, of South-Reps, to ſee the country, and the celebrated huſbandry, of the FLEG HUNDREDS.

We went by the ſea coaſt, and returned by the "broads" and more inland parts of the country.

We paſſed through the following hundreds and pariſhes.

PARISH.

106.
DISTRICT.

	Parish.	Soil.	Husbandry.
N. Erpingham.	Thorp Market	light	paſſable
	South-Reps	ditto	good
	Gimmingham	ditto	paſſable
	Trunch	deeper	good
Erp. & Tunſtead.	Knapton	good	ditto
	Paſton	ditto	ditto
	Backton	ditto	ditto
Happing.	Walcot	very good	ditto
	Haſbro'	ditto	ditto
	Leſſingham	ditto, with marſhes	ditto
	Hempſtead	ditto	ditto
	Palling	ditto	ditto
	Waxham	ditto, and very flat	Mr. B———
	Horſey	ditto	ditto
W. Fleg.	Winterton	light, but rich	paſſable
East Fleg.	Hemſby	a rich loam, with common fields	ditto
	Ormeſby	ditto ditto	ditto
	Kaiſter	ditto, with marſhes	ditto
	Yarmouth	ſurrounded by low grounds and water	almoſt all common
	Maltby	rich loam, with commons	nothing extraordinary
	Filby	ditto, and broads	paſſable
W. Fleg.	Burrow	rich loam	ditto
	Rolleſby	ditto	ditto
	Repps	ditto, with common fields	ditto
Happing.	Potter Hayham	do. with marſhes & broads	ditto
	Catfield	ditto, with low grounds	ditto
	Sutton	ſtill flattiſh	ditto
	Stalham	good ſtrong land	good
	Brunſted	ſtill ſtrong	very good
	Eaſt Ruſton	yet friable	excellent
Tunſtead.	Redlington	ſtrong good loam	ditto
	Witton	ditto, ſome lighter	good
	Edenthorp	ditto	ditto
	Backton	a charming ſoil	ditto

Knapton to Thorp, ſee above.

From

106. DISTRICT.

From a general view of this detail, the hundred of HAPPING (and not the hundreds of *Fleg*) ſtands higheſt on the ſcale of huſbandry: and, as I ſet out without prejudice, I could have no other bias to my opinion than that which I received from the objects which ſtruck me.

FLEG.

The *ſoil* of the FLEG HUNDREDS is rich; ſome parts of it being naturally fertile, in a very high degree; and the reſt rendered ſo by clay, marl, and "Yarmouth muck." The arable parts are here ſpoken of.

THE FLEG HUNDREDS.

But there are in theſe hundreds large tracts which are covered with water, or occupied by reed and other aquatics; and others which are frequently overflowed in winter, but afford in ſummer extenſive "marſhes," or grazing grounds, for lean Scotch and young cattle.

Thoſe are another ſource of riches to the arable lands; on which the marſh ſtock is kept, and generally fatted on turneps, during the winter months; beſides great quantities of manure being alſo raiſed from ſedge and other litter cut out of theſe fens and marſhes.

THE FLEG HUSBANDRY.

We called upon Mr. Ferrier, of Hemſby, who occupies his own eſtate, and is univerſally acknowledged as one of the beſt farmers in "Fleg."

" Fleg." He very obligingly ſhewed me his farm, and favored me with a recital of his practice. 106. FLEG HUSBANDRY.

The Fleg farmers, it is true, get amazing crops; they reckon from ten to twelve coomb of wheat, and fifteen to twenty coomb of oats, an acre, no very extraordinary produce: but when we learn that crops like theſe are produced from the ſucceſſion, or from any management nearly reſembling the ſucceſſion, of wheat, barley, clover, wheat, oats, wheat; every perſon converſant in farming muſt exclaim, that the ſoil which will bear ſuch treatment is extraordinary indeed; more eſpecially when he is told, that the crop of wheat which follows the oats is generally better than that which preceded them; the oat-crop being thrown in as a damper of the raging fertility of the ſoil.

Mr. Ferrier, who is a very ſenſible, judicious, plain farmer (though formerly a ſailor), having obſerved that wheat after clover, or a ſummer fallow, became too rank to ſtand, and ran too much to ſtraw to yield a large produce of grain, ingeniouſly contrived this intervening crop of oats, in order to correct the over-abundant fertility or rankneſs of the ſoil; and in this his ſupe-

106. SUMMER FALLOW.

ſuperiority of management ſeems principally to conſiſt. He ſeems to conſider a ſummer fallow as the moſt dangerous proceſs that can occur upon a farm; for the wheat crop which ſucceeds it he has found invariably ſpoilt through an over-rankneſs; and what appears much more extraordinary, the barley crop which follows the wheat is in this caſe generally too ſmall; owing, as Mr. F. ſuppoſes, to the wheat having too much impoveriſhed the ſoil: this, however, does not accord with the practice of wheat, oats, wheat. I have no doubt of Mr. F.'s veracity, or of the fact; but apprehend it is produced by ſome other cauſe than the poverty or exhauſtion of the ſoil.

FLEG SOIL.

Mr. Ferrier's ſoil is principally a rich dark-coloured loam, except one piece or two, which are of a more ſandy nature. A piece near his houſe is peculiarly fertile: he never knew it to fail producing a valuable crop. A recently-made ditch gave me an opportunity of examining it. It is one uniform maſs of rich black loam, for more than two feet deep; and under this lies a brick earth: a ſoil, this, capable of producing madder, woad, hemp, or any other vegetable of our climate, which requires a rich deep ſoil. The principal part of his eſtate, how-

however, is of a much ſhallower ſoil, not deeper than the plow goes; and its preſent very amazing fertility he aſcribes, in a great meaſure, to his having *clayed* it. Indeed to this ſpecies of improvement the fertility of the Fleg Hundred is allowed to be principally owing. 106. FLEG CLAY.

Mr. F. gave me an opportunity of examining his clay pit; which is very commodious; the uncallow is trifling, and the depth of the bed or jam he has not been able to aſcertain.—It is worked, at preſent, about ten or twelve feet deep.

The colour of the foſſil, when moiſt, is dark-brown, interſperſed with ſpecks of white; and dries to a colour lighter than that of fuller's earth; on being expoſed to the air, it breaks into ſmall die-like pieces.

From Mr. F.'s account of the manner of its acting, and more particularly from its appearance, I judged it to be a *brown marl*, rather than a *clay*; and, on trying it in acid, it proves to be ſtrongly calcareous; effervеſcing, and hiſſing, more violently than moſt of the *white marls* of *this* neighbourhood: and what is ſtill more intereſting, the *Hemſby clay* is equally turbulent in acid, as the *Norwich marl*; which

106. FLEG CLAY. brought, by water, forty miles into this country, at the exceſſive expence of four ſhillings a load upon the ſtaith; beſides the land-carriage. (But ſee MARL, Vol. I.)

It is ſomewhat extraordinary that Mr. F. ſenſible and intelligent as he is, ſhould be entirely unacquainted with this quality of his clay; a circumſtance, however, the leſs to be wondered at, as the Norfolk farmers, in general, are equally uninformed of the nature and properties of marl.

The quantity ſet on by Mr. F. was about forty middling loads an acre, about twenty years ago:—it is now beginning to wear out; and he is of opinion his land will not bear claying a ſecond time.

For want of mould he is ſometimes obliged to uſe ſome clay for the bottoms of his dung-hills; but he does not much approve of it, preferring good mould when he can get it.

THE FLEG WORKMEN. The Fleg farmers are noted for their quick diſpatch of buſineſs; and for the great quantity of work they get done by a given number of ſervants and labourers. Mr. F. made the obſervation, which is corroborated by Mr. E. (formerly of Fleg) who gives for inſtance, that he has had twenty loads of tough ſedgy muck

muck filled, daily, by a common day labourer! 106.

FLEG SOIL.

Mr. Ferrier gave a ſtriking inſtance of the fertility of the Hemſby ſoil. He has known a farm driven by a beggarly tenant, who has been ſucceeded by another, who has ſtill continued to drive it; yet, after all, it has retained its prolific qualities; and has ſtill continued to throw out abundant crops; eſpecially if a full crop of *clover* can be obtained; a thing which Mr. F. ſpeaks of as an improvement almoſt equal to that of a coat of muck.

CLOVER.

TURNEPS IN FLEG.

Mr. F.'s management of his *turneps* is very judicious.—He begins with thoſe which lie fartheſt from home; throwing them abroad in the adjoining ſtubbles and lays; but in winter he brings his cattle into the yard; which is a very convenient one; and is, I believe, eſteemed the firſt in the country.

It conſiſts of a large ſquare: on one ſide of it ſtand the barns; and, on the oppoſite ſide, a long range of troughs or mangers; behind which is a gangway for the feeder; and behind this (out of the yard) the turnep-houſe.

The turneps are tailed, and freed from the principal part of the dirt, and put into the troughs entire; which Mr. F. eſteems, upon

106. TURNEPS IN FLEG.

the whole, a better practice than chopping them.

The troughs ſtand on the higheſt ſide of the yard, upon a riſing ground; ſo that the bullocks always ſtand clean to feed, while the urine ſettles down among the ſtraw in the lower parts of the yard.

The poſts which ſupport the manger run up fence-height, and have a ſingle rail paſſing from one to another, to prevent the bullocks from clambering over the troughs (A ſhed under which the bullocks could feed and lie down warm and comfortable in rainy cold weather, would be a great improvement to this yard).

Turneps being now run up to bloſſom—Mr. F. mows off the tops with a ſithe, giving theſe alone to his fatting bullocks; while his cows and lean ſtock have the bottoms given them entire. This judicious management has two good effects: the bullocks inſtead of receiving a check, as they are apt to do, when turneps are in this ſtate, are puſhed on, perhaps, faſter than when the bottoms are in full perfection; and the ſtock cattle, by not having had a taſte of the tops, eat up the bottoms the cleaner.

How

How much preferable is this management to that of his neighbour 'Squire ———, who having turned twenty fine bullocks into a close of charming turneps, (such as would have been worth in this part of the country three or four pounds an acre) they have licked off the blossoms, and the better parts of the tops, and are now pining over the stalks and bottoms. 106. TURNEPS IN FLEG.

This piece of turneps, as well as the remains of Mr. Ferrier's, and the other remaining pieces in the neighbourhood, shew what noble crops of this valuable root are grown in the Fleg Hundreds.

These and a thousand other circumstances are undeniable proofs of the richness of the Fleg soil: while the universal foulness which overruns the crops of wheat and clover is a proof equally evident of the *uncleanliness* of Fleg farmers: from our leaving Happisbro', Hempstead, &c. until our return to Stalham and Brunstead, we saw very few pieces, either of wheat or of clover, which did the owners any degree of credit. FLEG SOIL. FLEG HUSBANDRY.

Fences. In this necessary piece of husbandry the Fleg husbandmen excel; while the hedges of Happing and Tunstead, either from the na- HEDGES IN FLEG.

1806. HEDGES IN FLEG.

ture of the air and ſoil, or from miſmanagement, or *perhaps* by *old age*, are greatly below par; the fences being mere mud walls, with here and there an old ſtunted thorn. Near the coaſt, the ſea air may have ſome influence; but in Fleg, equally near to the ſea, the hedges are flouriſhing and beautiful in a high degree.—The Fleg farmers ſeem fully maſters of the ſubject of live hedges. They plant the layer at a moderate height, and are aware of the utility of cutting it down to the ſtub at four or five years old; facing and backing the ditch, and ſetting on a new hedge. This ſecures them a fence in perpetuity; for before the ſecond dead hedge begins to fail, the quick is become a perfect fence. Another good practice is that of trimming off the young ſhoots which ſprawl over the ditch; by which means their hedges become thick at the bottom.—Add to this, they do not ſuffer their quick to ſtand too long, before they cut it down to the ſtub; ſo that an old overgrown hedge, or row of timber-like "bulls," is ſcarcely to be ſeen. Their method of felling them, too, is much preferable to the practice of this part of the country; where the ſtubs are uſually cut off ſmack-ſmooth with the face of the bank, and

many

106.

many of them frequently buried in it, ſo as to be totally deſtroyed: whereas, in Fleg, the ſtubs, univerſally, whether young or old, ſtand ſix or eight inches out of the face of the ditch; by which means a number of ſhoots is produced. The lately raiſed fences have moſt of them furze growing on the backs of the banks.

HEDGES IN FLEG.

Feeding wheat. Throughout the journey, the wheat appeared to be almoſt univerſally paſtured, by ſtock of every denomination; ſheep excepted: of which ſtock we did not ſee a ſcore either in the Happing or the Fleg Hundreds! but calves, young ſtock, cows, and even fat bullocks, and horſes, were ſtill to be ſeen in almoſt every cloſe of wheat we paſſed. The ſpring of this year, however, is remarkably late; the turneps are gone, and the graſs not yet come to a bite; ſo that wheats, this year, are more univerſally fed, and fed later, than perhaps was ever known. Mr. Ferrier ſeems almoſt the only exception to the practice: he never feeds his wheat, from a general idea that "the firſt fruits are the beſt."

FEEDING WHEAT.

SHEEP.

It is obſervable, that let the Norfolk ſoil be ever ſo ſtrong, it is not ſtubborn; and let it be even ſoddened by heavy rains, and rendered

THE SOIL OF NORFOLK.

106. NORFOLK SOIL.

cold and livery by laying flat, it is no ſooner expoſed to the air than it becomes mellow and friable. This peculiar quality is ſaid to be principally owing to marl (or clay); by the fertilizing quality of which, land that is ſufficiently ſtrong for wheat, is rendered ſufficiently tender for turneps and barley. Before the uſe of marl and clay the Fleg farmers could not grow turneps; whereas now they excel in that valuable crop. Mr. Ferrier, in one of the ſtiffeſt of his pieces, put his toe upon a clod to ſhew me this excellent property; and with a ſlight preſſure of his foot burſt it to an almoſt impalpable powder. This friability of ſtrong land is, perhaps, one of the beſt criterions of a good ſoil.

FARMERS.

Mr. B———e. The character of this man is ſo very extraordinary, that I cannot refrain from ſketching ſome of its principal features. He was, I believe, bred in the army; ſerved ſome time in the militia; has fought two or three duels; quarrelled with moſt of the gentlemen of the county; and, coming to a good paternal eſtate, diſcharged his tenants and commenced farmer.

He is now an occupier of 1700*l.* a year—yet he has neither ſteward nor even bailiff to aſſiſt him:

him: no wonder, then, he abuſes and receives abuſe from his work-people; or that he ſometimes frightens them away; his harveſt, perhaps, ſtanding ſtill, until his neighbours have finiſhed. He attends fairs and markets—ſells his own corn and his own bullocks; and even finds time to attend to the taking in giſt ſtock upon a very extenſive marſh—and this without any aſſiſtance; ſave that of his lady, who keeps his accounts. 106. FARMERS.

My fellow traveller being acquainted with him, we rode through his farm yard, and found him looking over ſome young cattle which had been brought up for his inſpection. His perſon is groſs, and his appearance bacchanalian—his dreſs that of a ſlovenly gentleman.—There is a politeneſs in his manner; and his converſation beſpeaks a ſenſible intelligent mind; borne away, however, by a wildneſs and ferocity which is obvious in his countenance, and diſcovers itſelf in every word and action. Nevertheleſs, it is ſaid, that, in a polite circle, Mr. B. *can* excel in politeneſs.

The pariſh of Waxham is principally in his own hands; and the adjoining little pariſh of Horſey is entirely in his occupation.

The country round him is exceedingly flat and low, being nearly on a level with the ſea at high-

106. high-water, and defended from it only by the
FARMERS. Marram Banks, which are broken into gaps at every two or three hundred yards; ſo that in ſtormy weather the ſea ruſhes through, and frequently does conſiderable damage by overflowing the country. Mr. B. told us, that he had four acres of very fine cole-ſeed ſwept down during the late tempeſtuous weather.

His land, however, which lies out of the water's way, is rich and fertile in a high degree; and Mr. B. it is ſaid, gets exceedingly fine crops from it; ſo that it is probable, notwithſtanding the irregularity with which his affairs are conducted, and that want of attention to minutiæ which muſt neceſſarily occur in ſuch a boundleſs ſcene of buſineſs, Mr. B. does not injure his fortune by farming; for it ſeems generally allowed that no farmer gets his work done *ſo cheap* as Mr. B.

MARRAM BANKS. *Marram Banks.* The country towards the coaſt from Happiſbro' to Winterton, about ten miles, is a dead flat; and, to the eye, appears to lie lower than the ſea at high water. By the ſide of the beach runs a range of broken, irregular hillocks, from five to fifteen or twenty feet high, and from fifty to upwards of a hundred yards in width at the baſe; compoſed entirely

entirely of ſea ſand; which, in ſome places, is pretty well overgrown, and bound together by a ruſh-like plant, called, in that neighbourhood, "marram" (the *arundo arenaria* of LINNÆUS) which the poor people cut and ſell for thatch. 106. MARRAM BANKS.

Theſe hillocks, however, do not ſerve the purpoſe of a ſecure embankment againſt the ſea; they being, in many places, divided down to their baſes, by ſluices of different widths; namely, from five to fifteen or perhaps twenty yards wide. Through theſe inlets, in boiſterous weather, and with an eaſterly wind, the ſea ruſhes, and overflows the country.

The hills have a picturesque, though dreary appearance, and afford a romantic ride:—the traveller may in general paſs either on the beach or the land ſide: winding through the openings at pleaſure.

The manner in which theſe banks have been originally formed appears at firſt ſight myſterious: how the ſand ſhould be blown up into heaps, and not ſcattered flat over the face of the adjoining country, ſeems inexplicable. The marram, it is true, may have aſſiſted; but this alone, ſeems unequal to the taſk.

Until we had paſſed Mr. B—e's marſhes, the beach lay open to the country; ſo that the ſtock

106. MARRAM BANKS.

ſtock have free egreſs to the ſea; on the edge of which they delight to lie in the heat of the ſummer; when they lie cool and free from the flies, with which the marſhes are greatly peſtered. But, having paſſed Mr. B——'s grounds, the proprietors of the next marſhes are under the neceſſity of fencing againſt the beach; leſt their cattle ſhould ſtray into Mr. B—'s liberty, who is lord of the manor.

This is done by placing rows of faggots in the gaps, between the ſand-hills; which, being ſteep on the ſide towards the ſea, are of themſelves a fence.

The effect of theſe faggot-fences is ſtriking; for the ſand being blown upon the beach in a ſimilar manner to ſnow, it drifts in the ſame way; and, in ſome places, the tops of the faggots are only to be ſeen; the ſand having drifted on both ſides; more particularly on the ſide towards the country; ſo that the cattle might now almoſt walk over them: and it ſtrikes me very forcibly, that from fences, to keep the marſh cattle from ſtraying away upon the beach, have originated the Marram Banks.

But whether this is the fact or not, I am fully convinced that by faggots, or ſome other

more

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MARRAM BANKS.

more ſubſtantial fencing, Marram Banks might, at a trifling expence, be converted into a barrier not to be broken by the ſea: for, notwithſtanding the long and violent eaſterly winds which have lately blown, ſuch as to violence and continuance has ſcarcely been known before, there is only one place in which the ſea has been able to move even theſe bramble-faggots; and this has happened in a gap which is wider than ordinary: the faggots, here, being forced out and ſcattered over the marſhes.

From the curſory view I have had, the moſt eligible way of joining the hillocks, ſo as to form a regular embankment, ſeems to be this:—Make a double fence in each gap; placing the two fences at, perhaps, twenty or thirty yards diſtance from each other; or, more generally ſpeaking, at five to ten yards within the ſkirts of the preſent bank. As ſoon as the hollow ſpace, between the firſt pair of fences, be filled up with ſand, raiſe another pair, a few yards within the firſt; and, above theſe, another and another, until the gap be filled up, or be raiſed to a ſufficient height; and then, on the top, propagate the marram plant.

Two rows of faggots might be ſufficient for the narrow gaps; and for the larger ones ſhip-

wreck,

106. MARRAM BANKS.

wreck, or other old ſhip-timber, might be uſed; more eſpecially for the foundation courſe.

If the ſea ſhould hereafter gain upon the banks, ſo as, in proceſs of time, to endanger the whole, raiſe a fence on the land-ſide at ſome diſtance from the old banks, to catch the ſand blown over them; and thus from the wreck of one embankment another might be raiſed, and the country kept in perpetual ſafety.

Mr. B —— e has attempted to make the embankment a public matter; but has not ſucceeded. It ſtrikes me, however, that it would be well worth his while to defend his own coaſt at his own expence: but he ſays, "It "is not for me to attack the German Ocean "ſingle-handed."

GEN. MAN. OF ESTATES.

Mr. Anſon has hit off a very great improvement upon his eſtate near Yarmouth.

On the Suffolk ſide of the river, oppoſite the Key of Yarmouth, were ſome low grounds, let, I believe, as marſhland. Theſe grounds have lately been divided into lots, and let on building leaſes of ninety-nine years, at the greatly improved rent of ſeven pounds an acre; beſides the advantage which will accrue at the expiration of the term.

Such

Such a ſtroke as this is a *real* improvement of an eſtate; and there are few extenſive eſtates which will not, if properly attended to, admit of being advanced, without ſending the farmer to jail, or the cottager to the poor-houſe. 106. GEN. MAN. OF ESTATES.

107.

MAY 12. WORSTEAD FAIR.—This fair is held on Old Mayday, and is called "May Fair." It has for many years been noted for fat bullocks. This year, however, there were not more than a hundred bullocks in the fair, and not twenty of thoſe which were *fat*. There were about three hundred head of cattle; chiefly two-year-olds, and cows and calves, with ſome few buds. MARKETS.

The Norwich butchers were the principal chapmen for bullocks.

108.

MAY 17. Laſt year,—to render my reſidence more commodious, as well as to gain ſome information on the ſubject of cheeſe-making—an art I was then a ſtranger to—I rented a ſmall dairy of cows. I took them the rather as I had then in my ſervice an excellent COWS.

108. CHEESE. cellent Wiltshire dairywoman; who, I was in hopes, might be able to make some improvement on the Norfolk method of making cheese; which, I had been given to understand, was execrable.

Having long considered this interesting subject as being allied to experimental philosophy, I placed it in that light, and paid as much attention to the different processes as an active scene of employment would permit me.—What I have been able to do is only an essay; but it is sufficient to convince me, that with leisure and application, much might be done towards bringing this, at present mysterious, but important subject, to some certain and fixed principles.

In registering the information I have been able to obtain, it will be proper to digest it under the following heads:

1. The preparation of the rennet.
2. The coagulation of the milk.
3. The management of the curd.
4. The management of the cheese.

1. *Rennet.* The curd which happens to be contained in the stomach of the calf when butchered, together with the hairs and dirt which are inseparable from it, are used by the dairy-

dairy-women of *this* country to coagulate their milk: hence, probably, the rancid flavor of the Norfolk cheese; perfectly resembling in scent the *parent* curd; and *this*, as nearly as may be, *its more matured self*. 108. CHEESE.

The rennet which I made use of was prepared in the following manner.

Take a calf's bag, maw, or stomach; and, having taken out the curd contained therein, wash it clean, and salt it thoroughly, inside and out, leaving a white coat of salt over every part of it. Put it into an earthen jar, or other vessel, and let it stand three or four days; in which time it will have formed the salt and its own natural juices into a pickle. Take it out of the jar, and hang it up for two or three days, to let the pickle drain from it; resalt it; place it again in a jar; cover it tight down with a paper pierced with a large pin; and in this state let it remain until it be wanted for use. In this state it ought to be kept twelve months: it may however, in case of necessity, be used a few days after it has received the second salting; but it will not be so strong as if kept a longer time.

To prepare the rennet for use; take a handful of the leaves of sweet-briar,—the same

108. CHEESE.

quantity of the leaves of the dog roſe, and the like quantity of bramble leaves; boil them in a gallon of water, with three or four handfulls of ſalt, about a quarter of an hour; ſtrain off the liquor, and, having let it ſtand until perfectly cool, put it into an earthen veſſel, and add to it the maw, prepared as above. To this is added a ſound good lemon, ſtuck round with about a quarter of an ounce of cloves; which give the rennet an agreeable flavor.

The longer the bag remains in the liquor, the ſtronger of courſe will be the rennet: the quantity, therefore, requiſite to turn a given quantity of milk, can only be aſcertained by daily uſe and obſervation.

When the rennet is ſufficiently ſtrong take out the bag; hang it up two or three days for the rennet to drain from it;—reſalt it;—put it down again into the jar; and thus continue to treat it, until its virtues are exhauſted; which will not be until it has been uſed ſeveral times.

By ſuffering one or more bags to remain in the liquor, the rennet thus prepared may be raiſed to a very high degree of ſtrength, as will appear in the following obſervations.

The leaves and the ſpice, it is probable, have no other effect than that of doing away the

the ill flavor of the maw; which, if ever ſo well cleaned, retains a faint diſagreeable ſmell; whereas the rennet prepared as above, is perfectly well flavored. 108. CHEESE.

It is, however, I find, an idea among the Wiltſhire dairywomen, that the leaves correct any rankneſs or evil quality in the milk, ariſing from a rankneſs of paſture: they being further of opinion, that different paſtures require different ſorts of herbs to correct them; and ſome of them, it ſeems, are, or pretend to be, ſo deeply verſed in this art, that they will undertake to correct any milk, ſo as to prevent the riſing "heaving" "or blowing" of the cheeſes made from it; and, conſequently, the rancidneſs which uſually accompanies a porous cheeſe.

This is, no doubt, a grand object of cheeſe-makers; but it is not, I apprehend, to be obtained by ſo ſmall a proportion of vegetable juices as paſs with the rennet into ſo large a proportion of milk. Nevertheleſs, it appears to me highly probable, that this grand deſideratum lies within the reach of the chemical art; and that, by a courſe of judicious experiments, ſome vegetable or mineral preparation, adequate to this valuable purpoſe, may be diſcovered.

108. CHEESE. 2. *Coagulation.* Next to the art of correcting the milk (an art as yet in its infancy) this seems to claim the attention of the experimentalist.

It is known, from daily experience, that the warmer the milk is, when the rennet is put to it, the sooner it will coagulate, with a given quantity of rennet of a given strength.

It is equally well known that the cooler the milk, and the longer it is in coagulating, the more tender and delicate the curd becomes: on the contrary, if the milk be too hot, and the coagulation take place too rapidly, the curd proves tough and harsh.

But it seems to be a fact, equally well established, that a cheese made from milk, which has been cooly and slowly coagulated, is longer before it become marketable, than one made from milk which has undergone a less deliberate coagulation; and which, being drier, and of a harsher texture, sooner becomes "cheesey," and fit for the *taster*.

Therefore, the great art in this stage of the process lies in—

The degree of warmth of the milk when *set*; that is, when the rennet is put to it; or, in—

The

The degree of heat retained by the curd when it *comes*; that is, when the coagulation has sufficiently taken place; or, in— 108. CHEESE.

The length of time between the *setting* and the *coming*. Which length of time may be regulated either—

By the degree of the warmth of the milk when set; or—

By the state of warmth in which it is kept during the time of coagulation; or—

By the quantity and strength (taken jointly) of the rennet.—

To endeavour to gain some information on this subject, I made the following observations.

1781. *June* 5. Twentythree gallons of milk, heated to ninetysix degrees of Fahrenheit's scale, with two tea-cup-fulls of weakish rennet, came in one hour; the curd delicate and good.

June 6. The same quantity of milk, of the same heat, with the same quantity of rennet, came in nearly the same time; the curd somewhat tough; owing, probably, to the milk having been "burnt to the kettle" in which it was heated.

June 7. Twentyseven gallons of milk, heated to ninetyfour degrees, with the same quantity of rennet, came in about two hours; the curd very good.

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June 8. Twentyſix gallons of milk, heated to one hundred and two degrees, with one tea-cup-full of rennet, came in two hours and a half; curd very good.

June 9. Twentyfive gallons of milk, heated to one hundred degrees, with a tea-cup-full and a half of rennet, came in about one hour and a half; the curd good, but ſomewhat tough; owing perhaps to the milk being kept too warm in the cheeſe tub, by being covered up cloſe with a thick cloth.

Note, On the ſeventh and eighth, the whey retained a heat of about eightyeight degrees, whereas the whey this morning was ninetytwo degrees: ſo that, perhaps, it is not the heat when it is *ſet*, but the heat when it *comes*, which gives the quality of the curd.

June 10. Twentyfive gallons: ninetyſix degrees: two cups: uncovered: came in two hours and a quarter: whey eightyſeven degrees: curd very tender.

June 11. Twentythree gallons: one hundred degrees: more than a tea-cup: uncovered: did not come in two hours; owing to the rennet being lower in ſtrength than before: therefore, added a little more rennet; which brought it in about three hours, from firſt ſetting:

ting: the whey eightyſeven degrees: the curd uncommonly delicate. 108. CHEESE.

June 12. Twentyfour gallons of milk: one hundred degrees: two cups of rennet: uncovered: came in two hours: whey eighty-nine degrees: curd uncommonly *tender*.

June 13. Twentyeight gallons of milk: ninetytwo degrees: three cups (ſay ſtrongly renneted): covered up with a coarſe linen cloth: came in one hour and a half: whey eightyſix degrees: curd very good, and of a very fine colour; though perhaps would have handled tenderer, if it had not ſtood ſome time after it came before it was broke up.

Perhaps much depends on its being broke up in the critical minute.

June 14. Twentyeight gallons: one hundred degrees: two cup-fulls: uncovered: came in one hour and a quarter: whey ninetyfour degrees: curd ſomewhat harſh, but of a good colour.

The change of colour is therefore owing to the change of paſture.

Note, The milk ſhould be covered to make it come together:—this came and grew hard at the bottom, half an hour before it was ſet at the top.

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June 15. Twentyeight gallons: milk heated to ninetyfive degrees: with two cups of rennet: and covered after it had ſtood three quarters of an hour: came in one hour and a half: whey eightynine degrees (the morning warm): curd very good and tender.

June 16. Thirty gallons of milk: heated to one hundred and three degrees; but lowered by two pail-fuils of cold water to ninetyſix degrees; with two cups and a half of rennet; and kept cloſe covered: came in one hour: whey ninetyfour degrees: curd pretty good; but not ſufficiently tender.

June 17. Twentyeight gallons: ninetyſeven degrees: two and one-half cups: covered; but not cloſe: came in one hour and a half: whey not tried: curd ſomewhat tough.

Note, The toughneſs is owing, perhaps, to ſome milk of a new calven cow being among it.

Note alſo, To try the exact heat of milk immediately from the cow, immerged a diſh in the pail while milking. After it had lain long enough to receive a degree of heat equal to that of the milk in the pail, emptied it, and immediately milked into it from the teat (the cow being

being at this time about half milked); the heat *ninetyfive degrees.* 108. CHEESE.

Note alſo, The cheeſes of yeſterday (the 16th of June) preſs remarkably elaſtic, and ſpungy (like a fungus): *perhaps* owing to the milk's coming too hot; or *perhaps* to two or three of the cows being then a-bulling *; or *perhaps,* being made thicker than uſual, the preſs was not heavy enough for them; or *perhaps* this ill quality is owing to the cold water being put into the milk.

June 18. Thirty gallons: ninetyfive degrees: covered: came in one hour and a half: whey ninetytwo degrees: curd pretty good.

June 19. Thirty gallons: ninetytwo degrees: two cups covered: curd very good.

June 21. Thirty gallons: ninetyeight degrees; lowered by half a pail of cold water to ninetyfive degrees: the curd good; but the cheeſes, like thoſe of the 16th preſs, hollow and ſpungy.

* I afterwards found that the milk of a cow, on the day of amour, retained, after having ſtood ſome time in the pail after milking, ninetyeight degrees of heat. This ſhews that the ſtate if not the quality of the milk is altered by the *heat* of the cow; and a cautious dairywoman always endeavours to keep ſuch milk out of her cheeſe tub.

There-

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Therefore, it is *probable*, from these two incidents, that lowering the heat of the milk, with cold water, has an evil effect.

June 23. (Evening) Fifteen gallons of new milk warm from the cow, retaining a heat of ninetytwo degrees, with two cups and a half of new weak rennet, and closely covered, came in three quarters of an hour: whey eightyeight degrees: curd very delicate and good.

June 25. Forty gallons of *half-skim* milk, heated to eightyseven degrees, with three cups of rennet, slightly covered, came in three quarters of an hour: whey seventynine degrees: curd remarkably good of *this* sort.

Sept. 8. In observing the effect of some remarkably strong rennet, I found that an ordinary tea-cup-full coagulated sufficiently upwards of forty gallons of milk, heated to only eightyeight degrees, in thirtyfive minutes.

From these observations it appears, that curd of a good quality may be obtained from milk heated from 87 to 103 degrees of Fahrenheit's thermometer; provided the rennet be so proportioned, that the time of coagulation be from three quarters of an hour to two hours and a half; and provided the milk be kept *properly* covered during the process of coagulation.

And

And from these as well as from a variety of other observations, which I made in the course of the summer, but which are not minuted, it appears to me, at present, that from 85 to 90 are the proper degrees of heat; that from one to two hours is the proper time of coagulation; and that the milk ought to be covered so as to lose in the process about 5 degrees of its original heat. 108. CHEESE.

But climature, seasons, the weather, and the pasture, may require that these bounds should sometimes be broken. A few observations, made in one season, and in one place, how accurately soever they may have been taken, are by no means adequate to the entire illustration of this very abstruse subject.

3. *The curd.*—In Norfolk, this stage of the process is very short. Part of the whey being laded off, the remainder, with the curd, is poured into a cloth:—the whey drains through; the curd is shook in the cloth; kneaded down into a vat; put under a light press, or perhaps under a stone; the cloth once changed; the curd once turned; and lo! a Norfolk cheese appears. The cows are milked and the cheese compleated in ten or twelve hours.

The

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The practice, in my dairy, has been uniformly this.—As ſoon as the curd is come at the top, firm enough to diſcharge its whey, the dairywoman tucks up her ſleeves, plunges her hands to the bottom of the veſſel, and, with a wooden diſh, ſtirs the curd and whey briſkly about: ſhe then lets go the diſh, and, by a circular motion of her hands and arms, violently agitates the whole; carefully breaking every part of the curd; and, at intervals, ſtirs it hard to the bottom with the diſh; ſo that not a piece of curd remains unbroken, larger than a hazel-nut. This is done to prevent what is called "ſlip-curd" (that is, lumps of curd which have ſlipped unbroken through the dairywoman's hands), which, by retaining its whey, does not preſs uniformly with the other curd, but in a few days (if it happen to be ſituated toward the rind) turns livid and jelly-like, and ſoon becomes faulty and rotten. This operation takes about five or ten minutes; or, if the quantity of curd be large, a quarter of an hour.

In a few minutes the curd ſubſides, leaving the whey clear upon the top. The dairywoman now takes her diſh, and ladles off the whey into a pail; which ſhe empties into a milk-

milk-lead to ſtand for cream, to be churned for whey butter *.

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Having laded off all the whey ſhe can, without gathering up the ſmall pieces of looſe curd floating near the bottom of the veſſel, ſhe ſpreads a ſtraining cloth over her cheeſe-tongs, and ſtrains the whey through it; returning the curd, retained in the cloth, into the cheeſe tub. When ſhe has got all the whey ſhe can, by preſſing the curd with her hand and the lading diſh, ſhe takes a knife and cuts it into ſquare pieces, about two or three inches ſquare. This lets out more of the whey, and makes the curd handy to be taken up, in order to be broken into the vats †.

* This is a practice peculiar to the cheeſe counties, and forms no inconſiderable part of the profit of a dairy in thoſe counties. In Norfolk, the whey, even from new milk, paſſes from the cheeſe veſſels immediately to the hog tub.

† A dairy ſhould be plentifully furniſhed with VATS, and ſome of them of different ſizes; for when three or four cheeſes are made at each meal, a number of vats become actually in uſe; and if there are not ſtill a number empty, the dairywoman becomes confined in her choice, and cannot proportion exactly her vats to the quantity of curd ſhe *happens* to find in her cheeſe tub; and keeping a little overplus curd from meal to meal frequently ſpoils a whole cheeſe.

Having

108. CHEESE. Having made choice of a vat or vats proportioned to the quantity of curd, ſo that the cheeſe, when fully preſſed, ſhall neither over nor under fill the vat, ſhe ſpreads a cheeſe-cloth looſely over the vat; into which ſhe re-breaks the curd; carefully ſqueezing every part of it in her hands; and, having filled the vat heaped up and rounded above its top, folds over the cloth, and places it in the preſs *.

In autumn, when the weather got cool and moiſt, the curd was *ſcalded*, "to make the "cheeſe come quicker to hand," (that is, ſooner ſaleable) and to prevent a white woolley coat from riſing. It is done thus: If from

* Much depends on the conſtruction and power of the PRESS. The excellency of conſtruction depends upon its preſſing level: if it has too much play, ſo as to incline and become tottering or leaning one way or another, and do not fall perpendicular upon the cheeſe board, one ſide of a cheeſe will frequently be thicker than another; and, what is ſtill worſe, one ſide will be thoroughly preſſed while the other is left ſoft and ſpongy. Its power may be given by a ſcrew, by a lever, or by a dead weight, and ought to be proportioned to the thickneſs of the cheeſe.

I had one conſtructed on the above principles; the power, a dead weight of ſtones, contained in a cubical box, moving in grooves ſo as to keep its bottom horizontal; the medium weight, 1 cwt. 2 qrs. but regulated, by the ſtones, agreeably to the thickneſs of the cheeſe or cheeſes to be preſſed.

new

new milk, ſcalding water (boiling water with a ſmall quantity of cold whey mixed with it) is poured over the whole ſurface of the curd as it lies at the bottom of the cheeſe tub: If from ſkimmed or other inferior milk, the outſides only are ſcalded, after the curd is in the vat, by firſt pouring the ſcalding water on one ſide, and then, turning the cheeſling, pouring it on the other. For if in this caſe the *curd* were to be ſcalded, it would render it hard, and ſpoil the taſte and texture of the cheeſe. In ſcalding the *cheeſling*, the curd is firſt put into the bare naked vat, and the upper part ſcalded: the cheeſe cloth is then ſpread over it, and the vat being turned, the curd falls into the cloth: the curd, with the cloth under it, is then put into the vat; the outer edges pared off; the parings broke, and rounded up in the middle; and the ſcalding water poured upon it as before; the folds of the cloth laid over, and the vat ſet in the preſs.

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The whey, being pretty well preſſed out, and the cheeſling (whether it has been ſcalded or not) having got firm enough to handle, which it will be in about half an hour, the dairywoman takes it out of the vat; waſhes the cloth in a pail of clean cold water; ſpreads it

108. CHEESE. it over the vat; turns the cheesling upon it; squeezes it gently into the vat; folds over the cloth; tucks in the corner with a wooden cheese-knife; and replaces the vat in the press.

Supposing the cheesling to be made in the morning, it now remains in the press, untouched, until the evening; when it is taken out, *salted*, put into a fresh dry cloth, and left in the press all night.

The method of salting is this:—The salt being well bruised, and the lumps thoroughly broken, it is spread plentifully on each side of the cheesling, so as wholly to cover it, about one-tenth of an inch in thickness, more or less, in proportion to the thickness of the cheese. If this be of a considerable thickness, as suppose three inches and upwards, some salt is put into the middle of it, by stopping when the vat is half filled with curd, strewing on the salt, and, on this, putting the remainder of the curd.

Next morning, if the curd be rich, or has been cold-run, the cheesling is turned into another dry cloth, and left in the press till evening: but if, on the contrary, the curd be from poor milk, or from milk which, before

setting

setting, had acquired any degree of sourness; or if it has been run hot and quick, the cheesling should, in the morning, be "bare-vatted;" that is, be put into the vat without a cloth round it, and be put again into the press until evening. 108. CHEESE.

The use of bare-vatting is to take out the marks of the cloth, and thereby evade a waste of labour in bringing the cheese to a smooth glossy coat. The reason for the above distinction is, therefore, obvious; for the harder the curd, the longer the marks of the cloth are in pressing out.

In the evening, that which was turned into the dry cloth in the morning, is now bare-vatted; and that which was bare-vatted in the morning, is now turned in the vat; and, having stood in the press until morning, the process is finished. The *cheeses* are taken out of the vats, and placed upon the shelf.

Thus, supposing the cheesling to be made on Monday morning, seven o'clock, it is, between eight and nine, taken out of the vat; the cloth washed; and immediately placed in the press again. On Monday evening, it is salted and, if wanted, pared *; put into a dry

* A cheesling should never, in strict propriety, be pared after it has been bare-vatted.

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cloth; and replaced in the preſs. On Tueſday morning it is bare-vatted, or the cloth changed; the cheeſling, in either caſe, being turned, and again put into the preſs. On Tueſday evening it is again turned; and on Wedneſday morning finally taken out of the vat and preſs.

4. *The cheeſe*—The objects of this moſt laborious department of cheeſemaking are, to preſerve the cheeſe found in itſelf, and to give it ſuch an *appearance* as will recommend it to a purchaſer.

Cheeſes newly made, naturally acquire a white ſcurfy coat; which, beſides hiding, if not cauſing the defects of the cheeſe, is at leaſt unſightly, and is a certain mark of the ſlovenlineſs of its maker. This ſcurf riſes more plentifully on a poor, than on a rich cheeſe. Cold moiſt weather encourages it; but, in warm weather, the oily exudation of a rich and well-made cheeſe goes near, of itſelf, to eradicate the *white*, and bring on that deſirable *blue* coat, which is at once a criterion of the goodneſs of the cheeſe and of the ſkilfulneſs of the dairy-woman.

The Norfolk dairywoman, however, pays little regard to appearances; and, to ſpeak truly of her, is equally ambitious to pleaſe the eye and

and the palate. Her method is this:—the cheeſe (or rather as yet a bundle of curd) being taken out of the preſs, is ſalted upon a large earthen platter, in the ſame manner a piece of beef or pork is ſalted; and, having lain ſome time in ſalt, it is put upon a ſhelf to dry and ſtiffen. 108. CHEESE.

Being in a manner unpreſſed; never cleaned; and but ſeldom turned; it is no wonder, that in a ſhort time the white ſcurfy coat gets full poſſeſſion of it; or that its ſurface ſhould appear bloated and wrinkled; or that its rind ſhould be divided by innumerable fiſſures; or that its appearance, all together, ſhould be that of a plumb cake, rather than of a cheeſe.

However with reſpect to appearances, the Norfolk dairywoman may plead, in excuſe, that her cuſtomers are familiarized to the *ſights* which ſhe prepares for them: but when ſhe follows a practice which ſubjects her produce, if not ſold off while yet in an unripe ſtate, to almoſt inevitable deſtruction, ſhe is highly culpable.

Cheeſes made in this country are attacked by an enemy little dreaded, or wholly unknown, in the cheeſe counties; namely, a ſpecies of

108. CHEESE. maggot, whoſe unlimited miſchievouſneſs ſeems to be confined to this part of the kingdom.

The fly, which is the cauſe of this ſerious miſchief, is of a ſpecies ſomewhat ſmall, ſlender, black, and ſhining; very much reſembling the ſmall winged ant. Wherever it finds a crack or other defect in the rind, be it ever ſo minute, it turns its tail towards the aperture; and, by the inſertion of a ſlender ſheath not unlike the ſting of a bee, there depoſits its eggs. If the fiſſure be ſufficiently large and deep, it enters its hind parts alſo: if ſtill deeper, it crawls backward into the cheeſe; leaving only its head in ſight, and thus injects its eggs to a conſiderable depth.

As the maggots riſe into life, they travel ſtill farther into the ſubſtance of the cheeſe; and, if it happens to be porous, ſoon pervade every part of it; in a few weeks working its total deſtruction: for not only the parts they immediately inhabit, but the whole cheeſe becomes bitter and entirely inedible; except by ſome of the good people of the country, to whom cuſtom has rendered even the maggots grateful.

Laſt year (1781) being remarkable for flies of every ſpecies, there were, in this neighbourhood,

hood, many dairywomen who had not, even in September, one thoroughly ſound new-milk cheeſe in their dairies. 108. CHEESE.

A remedy for this evil would be a valuable diſcovery to the Eaſt Norfolk farmer: for although Eaſt Norfolk is not properly ſpeaking a dairy country, there are a great number of cows kept in it; not only for its home conſumption of butter and cheeſe, but for the purpoſe of rearing bullocks for the London market.

The only remedy practiſed here, in common, is to place in the cheeſe-chamber large boughs, on which the flies ſettle. The boughs being loaded with flies, are taken into another room, and beaten upon the floor; by which means numbers may be deſtroyed; numbers, however, are ſtill left behind; and while there is one fly in the room, a defective cheeſe is not ſafe.

This miſchievous animal, whether in its fly or maggot ſtate, is very difficult to be deſtroyed, without actually cruſhing it. *By way of experiment*, ſhut up the cheeſe-chamber as cloſe as poſſible; and burnt in it not leſs than four or five ounces of ſulphur; cauſing a fume powerful enough to have ſtifled an elephant;

108. CHEESE. but not a fly ſuffered by it.—*Again*, put a ſlice of cheeſe affected by the maggot into ſome boiling water, immediately from the tea-kettle: let it lie a few minutes in the water: took it out and broke it: the maggots were, to every appearance, as much alive as if they had not been in the water!—It is in vain, therefore, to think of deſtroying the animal; for although the fly may be eaſily killed by hand or otherwiſe, and, with a little pains, the dairy and cheeſe-chamber might for a moment be cleared; yet, from the numbers which are bred in the neighbourhood, the very air is filled with them; and the room, of courſe, preſently repleniſhed: therefore, the only way left of avoiding the loſs is to endeavour to find out ſome means of defending the cheeſes themſelves againſt the attacks of theſe deſtructive enemies.

Theſe means, I flatter myſelf, are fully pointed out in the practice I am now regiſtering.

The firſt week or ten days, the new-made cheeſes are carefully turned once a day; great care being had not to break the yet tender rind in turning; nor to ſuffer it to be cracked by too free an admiſſion of a dry parching air.

As

As ſoon as they are become firm enough to be handled with ſafety, they are cleaned in this manner: ſome ſkimmed whey being put into a milklead, or other broad, ſhallow veſſel, ſo as to cover the bottom of it half an inch or an inch deep, the cheeſes to be cleaned are taken from the ſhelf and placed in the whey. One ſide being thoroughly moiſtened, the other ſide is placed downward: the edges too are wetted with a cloth, ſo as to make the whole coat of the cheeſe ſoaking wet. The dairywoman then takes a hard bruſh, and bruſhes every part of the cheeſe; frequently dipping her bruſh in the whey, to eradicate the white coat more readily and more effectually. This done, ſhe places them again on the ſhelves; but before they be quite dry, while their coats are yet moiſt, ſhe rubs them over with a cloth, on which a piece of whey, or other common, butter has been ſpread. This keeps the rind ſupple, and free from cracks; checks the ſcurfy coat from riſing; and, by ſtopping the pores and fiſſures of the coat, prevents the fly from depoſiting her eggs. If the rind be rough, from the marks of the cloth or other cauſe, ſhe ſcrapes them with a knife, or other inſtrument:

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this laſt operation, however, is as yet performed with great care and delicacy.

Having thus waſhed and ſcraped them two or three times (in the courſe of about a week from the firſt cleanſing) ſhe removes them from the dairy ſhelves into ſome ſpacious airy room, with a firm even floor, which ſhe firſt rubs plentifully with green ſucculent nettles, ſo as to give it a temporary greenneſs, and then places her cheeſes in rows upon the prepared floor. She now waſhes them no more; but, if the coat be yet rough, and the ſcurf continue to riſe, ſhe ſcrapes them more freely than before; and, as the rind gets harſh, ſoftens it with butter; thus continuing to treat them, and ſtill continuing to turn them once a day, until they acquire a rich golden poliſh, and the *blue coat* begin to ſhew itſelf.

This criſis, namely, the appearance of the blue coat, is not altogether regulated by the age of the cheeſe, but depends on its quality and the ſtate of the weather. Perhaps it may appear before the cheeſe be one, perhaps not until it be more than two, or even three, months old; therefore, no certain number of cleanings can be fixed; theſe rules, however, may be obſervable: ſcrape and rub them, until they be per-

perfectly ſmooth; mellow the rind with butter, whenever, for want of natural exudation, their coats get dry and harſh; thus continuing to keep them ſmooth, yellow, and gloſſy, until the blue coat begin to make its appearance, voluntarily; and then, but not before, begin to encourage the blue coat. 108. CHEESE.

This ingenious proceſs is thus conducted: Having rubbed the floor thoroughly with freſh nettles, the dairywoman places ſuch of the cheeſes upon it as ſhe judges to be ready for "coating;" and upon the top of each cheeſe puts three or four vine leaves; or, for want of theſe, a cabbage leaf. This, if the cheeſe be good, will in a day or two bring up the deſired veſtment: but an inferior cheeſe will take a longer time in coating; and as the leaves loſe their greenneſs and ſucculence, ſhe replaces them with freſh ones; and as ſhe turns the cheeſes, which is now done every ſecond or third day, ſhe re-covers the upper ſides with leaves; but wipes their edges hard with a clammy cloth; ſo that the *edge*, and a narrow ring round each ſide, ever retain the poliſhed yellow hue.

When the cheeſes were properly coated, and their edges had got ſufficiently firm, they were placed

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placed on edge in a cheese rack *, and, without further care, (except once a week moving them a little round, and now and then wiping their edges) there remained until the time they were sent to market,—which was yesterday.

The *soil* from which these cheeses were made is a sandy loam, but lies cooler, and is of a better quality than are Norfolk soils in general.

The *herbage* principally rye grass *(lolium perenne)*, oat grass *(bromus mollis)*, and white clover *(trifolium repens)*, being principally new-lays of three to five years old.

* *Cheese racks* save labour in turning,—collect the cheese into a small compass, and put it out of the way of vermin. They may be variously constructed. The plate rack, with four or five tier one above another, seems to be the best form. If the cheeses be nearly of one size, the rack should be made the same width at the top as the bottom: but if they be of different sizes, it ought to be made narrower at the top than at the bottom; and if they be of different thicknesses as well as of different diameters, the spaces for the respective cheeses should likewise be varied. A small rack may be hung with a rope and pullies at each end; so as to be drawn up and lowered down at pleasure: but a large one is difficult to sling, in a common room, in that manner; it ought therefore to stand on legs about two feet high, with a broad base-board projecting over the legs, so as to prevent vermin from climbing up into the rack. Mine was on the latter construction.

The

The *cows* of the Lancaſhire *breed* *, and of different *ages*. 108. CHEESE.

The *cheeſe*, in quality and appearance, reſembles very much that of inferior Warwickſhire, or the two-meal cheeſe of Glouceſterſhire; being lean and dry, conſidering the ſpecies of milk; which was neat, or nearly neat, from the cow.

This inferior quality is probably owing, in a great meaſure, to the quality of the ſoil; and perhaps, in ſome degree, to the method made uſe of in ſeparating the whey.

With reſpect to the *fly*, not one cheeſe in a hundred (after the miſchief was firſt diſcovered) ſuffered from it. There cannot be a greater proof of the eligibility of the method in this caſe practiſed, than that of my being able to preſerve the principal part of the dairy to a time when there is not, generally ſpeaking, another Norfolk cheeſe in *this* part of the county †.

If

* That ſomething conſiderable depends on the breed or *variety* of cow is evident, from an experiment I made with the milk of the Alderney cow; the produce from which was of a texture almoſt as cloſe and firm as bees-wax, and nearly as high-coloured; as different, in quality and appearance, from the produce of the long-horned ows, as if they were two diſtinct *ſpecies* of animals.

† On the Suffolk ſide of the county, about Harleſton and

108. CHEESE. If from one year's experience I might venture to dictate in the art of making cheese in Norfolk, it would be in this way.

1. To make use of a clean well flavored rennet.

2. To pursue the method now in use of separating the curd from the whey: for, although the method above described may be eligible on rich land (and is practised in the counties of Wiltshire, Gloucestershire, and Warwickshire), yet, on a leaner soil, it may be prudent to preserve as many of the butyraceous particles as possible in the curd, rather than to suffer them to escape from this, and pass through the whey into butter*; *provided cheeses of a sufficient contexture to secure them from the attacks of the fly, can be produced by the method of separating the whey now in practice in Norfolk.*

3. To let the cheeses remain in the press until they have acquired a sufficient degree of

and Diss, the method of making cheese partakes of the Suffolk practice; which, though *not celebrated*, is a degree above that of East Norfolk.

* It is, however, observable in this place, that, in point of *true profit*, it is highly probable that the *certain* advantage arising from the butter would more than overbalance any *probable* advantage which the quality of the cheese would receive by retaining in the curd *a part* of this butter.

firm-

firmneſs, and their rind ſuch a degree of toughneſs, that they may, on being taken out of the preſs, be ſafely handled, without danger of cracking. 108. CHEESE.

4. To keep their coats ſupple and clean; the firſt, to prevent, as much as poſſible, their cracking afterwards in turning; and the latter, to diſcover with greater readineſs, and to remedy with greater eaſe when diſcovered, any flaw which, through accidents or overſight, may happen.

5. If through accident or neglect the fly ſhould be ſuffered to make an impreſſion (which is eaſily diſcoverable by a dimple in the rind and its ſoftneſs to the touch), cut out the part affected (perhaps not yet larger than a walnut), duſt the wound with pepper, fill it up with butter, and cloſe it with a piece of ſoft paper: thus forming an artificial rind, which will ſecure it from further injury, until it has acquired an age ſufficient to recommend it to a purchaſer.

By theſe rules, *I am of opinion*, that cheeſe of a middle quality as to richneſs, and ſecure againſt the fly, might be produced in Eaſt Norfolk; *provided the preſent method of ſeparating the whey, will give the cheeſling a ſufficient degree of texture to be handled with ſafety* *.

* My doubts, reſpecting this matter, ariſe not more from

108. CHEESE. If not, *I am certain*, that by adhering closely throughout, to the practice above registered, a *wholesome* good cheese, palatable to men in general, and *proof against the fly*, may be made in East Norfolk, with a great degree of certainty.

from the loose crumbly texture of Norfolk cheeses in general, than from the following practice: which, likewise, strengthens my apprehensions of the richness of the cheese in question being lowered by the curd having been broken too finely in the whey.

A gentlewoman, who lives in this neighbourhood, who pays a personal attention to her dairy, and whose abilities in matters of household are indisputable, says, that when she wishes to make a cheese of a superior degree of richness, for her own table, she takes the curd and whey out of the cheese-tub very gently, with a fleeting dish (before they have been any way disturbed) and puts them immediately into the vat; upon which she places a broad hoop; by means of which she is able to pile up a sufficient quantity of this wheyey curd to fill the vat when prest. She then folds over the cloth, and lets the press down upon it, very gently and gradually; so as to squeeze out the whey, and at the same time retain that rich milky liquor which is mixed among the curd, and which by much breaking before it be put into the vat, is lost among the whey.—With care, she says, the whey may be drawn off quite green and clear; leaving the "buttery" particles behind in the cheese. By this means, she says, she has made cheeses which have toasted as fat as Gloucestershire cheese: but adds, that *great care is necessary in handling a cheese thus made; for if it crack, no pressing will ever close it again.*

109.

109. 109.

MAY 17. In the courſe of laſt ſummer I likewiſe paid conſiderable attention to the art of making butter; regiſtering, at the time of obſervation, the minutiæ of the different proceſſes. BUTTER.

In the production of good butter, much, no doubt, depends on *ſoil* and *herbage*; and ſomething, perhaps, on the ſpecies of *cow*:—much, nevertheleſs, depends upon *management*.

The different ſtages of the art are,

1. Milking the cow.
2. Setting the milk.
3. Preſerving the cream.
4. Churning.
5. Making up the butter, for preſent uſe.
6. Putting it down, for future uſe.

1. *Milking*.—Cleanlineſs is the baſis of the whole art.—A dairymaid ſhould not be ſuffered to ſit down under a cow, with a pail, which a fine lady would ſcruple to cool her tea in; nor until ſhe has waſhed the teat of the cow and her own hands: and, for this purpoſe, clean water and a cloth ſhould always be at hand.

A cow

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A cow ſhould be milked at regular and ſtated hours; and, if poſſible, always by the ſame perſon: for cows, in general, *will not give down their milk* ſo willingly to a ſtranger, as to one with whom they are intimate. The conſequence is, the richeſt and beſt part of the milk is left behind in the udder, and the cow which is not clean-milked becomes *dry* prematurely.

2. *Setting the milk.* Much depends on the cleanneſs of the veſſel, the degree of heat of the milk when ſet, and its depth in the veſſel.

In ſummer it is difficult to ſet milk too cool: —in winter no time ſhould be loſt in getting it as ſoon as poſſible into the pan or milklead. Should it be ſet too hot in ſummer, "the cream does not riſe ſo ſmooth and rich, nor in ſo large a quantity, as when it has been ſet of a due degree of warmth:—it is apt to come up *frothy*; and does not, in this caſe, prove well in the churn."

Judicious dairywomen, therefore, in ſummer, pour their new milk firſt into a large earthen jar, or other veſſel, there letting it remain half an hour; or until it be nearly cool, and the *froth* be ſunk; and then put it into the lead or pan

pan, in which cold water has, until that time, stood. 109. BUTTER.

If it be set too cool in winter, the cream will not rise so thick as when set immediately from the teat, or has had a little hot water put into the milk; viz. about a pint of water to a gallon of milk, or as much as will make it new-milk warm: that is, ninety to ninetyfive degrees.

The depth of the milk should not exceed two inches: from one to two is a proper depth. If the milk be set too thick, the cream does not rise so freely; nor, consequently, in so large a quantity, in a given time. If set too shallow, it is difficult to separate the cream from it.

3. *Preserving the cream.*—The great art here lies in keeping the cream free from rankness, to a proper age.

Fresh cream affords a well-flavored butter; but yields a less quantity than stale cream; it being a received opinion among dairy-women, that age, and a slight degree of *acescency* in the cream, increases the quantity, without injuring, sensibly, the quality of the butter; but that the smallest degree of *rancidity* in the cream spoils the flavour of the butter.

In winter, cream may be easily kept free from any degree of acidity; but, in summer, it re-

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quires ſome care to keep it entirely free even from rankneſs.

A quantity of cream, though ever ſo judiciouſly taken off the milk, will, when put into a veſſel, and ſuffered to ſtand ſome time, let fall a greater or ſmaller quantity of milk.

It has been diſcovered, that this milk, or dregs of the cream, which ſubſides at the bottom of the veſſel, becomes rancid much ſooner than the cream itſelf; and that, being ſuffered to remain at the bottom of the veſſel, it preſently communicates its rancidity to the cream: and further, that if it be permitted to mix again with the cream in the churn, the butter takes that marbled, half-cheeſe-like appearance, under which we too frequently ſee it.

Therefore, a judicious dairywoman never ſuffers theſe dregs to remain any length of time under the cream. She has two means of preventing it; namely, repeatedly ſtirring them together to prevent them from ſubſiding too frequently; and, when a proper quantity is ſubſided, pouring off the cream into a freſh veſſel, leaving the dregs behind. In ſummer, a good dairywoman ſtirs her cream-jar every time (generally ſpeaking) ſhe goes

goes into the dairy; and ſhifts it every morning (and in cloſe muggy weather every evening) into a freſh, clean, well-ſcalded jar, or other veſſel. 109. BUTTER.

To take off the rankneſs of cream produced from turneps, the *Norfolk* dairywomen ſometimes ſcald their cream: this, however, is allowed to leſſen its productiveneſs of butter; and I was told by a lady, whoſe attention to her dairy entitles her to credit in this caſe, that putting a quart of boiling water into each pail of milk before it be ſet, is a more effectual and leſs waſteful remedy.

4. *Churning.*—The principal art in churning lies in keeping the cream of a due degree of warmth in the churn; and in giving it a due and regular agitation. Warmth and a rapid motion make it come quick: coolneſs, and a gentle motion, bring it ſlowly. If butter come too quickly, it is ſoft and *frothy*, and ſoon turns rancid; nor does it part from the buttermilk ſo freely, nor yields ſo large a quantity, as when it has been a proper time in churning. If it come too ſlowly, there is labor loſt; beſides the butter loſing its flavor and texture. From one to two hours is a proper length of time in churning.

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If the weather be hot, the churn ought to be chilled with cold water, before the cream be put into it, and ſhould be placed in a cool ſituation; if cold, ſcald the churn with boiling water, and endeavour to churn in a warm room. If, in either caſe, theſe be not ſufficient, add hot or cold water to the cream, during the time of churning.

If the cream be inclined to get *frothy* in the churn, open its mouth for a few minutes, to let in the air, and give the froth time to diſſipate; and the butter will generally come ſooner, than it would have done, had the agitation been continued: for, while the cream is in a ſtate of *frothineſs*, the butter will not ſeparate. Reverſing the motion has ſometimes a good effect *.

* It is this ſtate of *frothineſs*, (fermentation it cannot be called) which ſometimes gives inexperienced dairy-women much fatigue of body, and anxiety of mind. In the days of witchcraft the cauſe was readily aſcribed; and the witch was often ſucceſsfully burnt out, with a red-hot poker. The devil, to this day, is now and then ſubjected to a ſimilar treatment; and with equal ſucceſs: for while the poker is heating the froth ſubſides; and, in cold weather, the warmth communicated to the cream renders this ſtroke of heroiniſm doubly efficacious. There may be other cauſes (than the frothineſs of the cream) of that obſtinate delay which not unfrequently happens in this important operation; which well deſerves a philoſophical inveſtigation.

If

If the butter come in ſmall particles which are ſlow in uniting, ſtrain off part of the buttermilk; and the butter, in general, will ſooner gather. Reverſing the motion generally gathers the butter quickeſt *. 109. BUTTER.

5. *Making up the butter.*—When the butter is ſufficiently gathered in the churn, which is known by the largeneſs of the lumps, and the cleanneſs of the *daſhers*, it is taken out; kneaded in a bowl, or other ſhallow veſſel, to let out the buttermilk; ſpread thin over the inſide of the bowl, and clean cold water poured over it; kneaded, broken, and re-ſpread in the water; the water poured off; the butter beaten, in large lumps or handfulls, of three or four pounds, againſt the ſide of the bowl; re-ſpread; ſalted; the ſalt worked in; re-waſhed; and re-beaten, until the water come off unſullied; which it will do after two or three waſhings. It is then broken into pound-lumps; re-beaten againſt the bowl; and printed, or otherwiſe made up.

But before the dairywoman begins to take the butter out of the churn, ſhe firſt ſcalds, and then plunges immediately into cold water, every veſſel and thing which ſhe is about to make uſe of; in order to prevent the butter

* A horizontal or barrel churn is here to be underſtood.

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from ſticking to them. In ſummer, when the butter is very ſoft, it is ſometimes neceſſary to rub them after ſcalding with ſalt, which greatly aſſiſts the wood in retaining the moiſture.

She alſo puts her own hands into the hotteſt water ſhe can bear them in; rubs them with ſalt; and immediately plunges them into cold water:—this ſhe repeats as often as ſhe finds the butter ſtick to them.

There is a *finiſhing* operation, which is ſometimes given in the neighbourhood of the metropolis, and perhaps in ſome few provincial diſtricts: in general however this excellent finiſh is omitted;—either through want of knowledge, or want of induſtry, or through *policy*: for its uſe being to give, not only firmneſs and a wax-like evenneſs of texture to the butter, but to extract from it, entirely, the buttermilk and the water in which it has been waſhed, the quantity is thereby leſſened; for ſo many ounces of milk and water extracted, ſo many ounces fewer of butter go to market: this however is the beſt proof of its utility; and butter cannot ſtrictly be ſaid to be marketable, until it has undergone this operation: which is thus performed.

The bowl or tray being wetted, to prevent the butter from ſticking to it, and a cheeſe-cloth

cloth ſtrainer or other cloth being waſhed in clean cold water and wrung as dry as poſſible; a pound lump of butter is placed in the bowl; and, with a ſtroke of the hand proportioned to the ſtiffneſs of the butter, is beaten with the cloth. As the pat of butter becomes flat and thin, it is rolled up with the cloth, (by a kind of dexterity which can only be acquired by practice and again beaten flat; the dairy-woman, every three or four ſtrokes, rolling up either one ſide or the other of the pat, and moving it about in the bowl to prevent its ſticking. As the cloth fills with moiſture (which it extracts from the butter and imbibes in the manner of a ſponge) it is wrung and re-waſhed in clean cold water. Each pound of butter requires, in cool weather, four or five minutes to be beaten thoroughly, but two minutes are at any time of eſſential ſervice.

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In warm weather it is well to beat it two or three times over; as the coolneſs of the cloth aſſiſts in giving firmneſs to the butter *.

* 1781, JULY 23. Weighed a lump of butter before and after being beaten with a cloth. Before beating it weighed ſixteen ounces and a quarter; after beating fifteen ounces and three quarters; juſt half an ounce of butter-milk and water being abſorbed by the cloth, during about three minutes beating. The cloth was wrung equally hard before and after the operation: a conſiderable quantity of milk and water was wrung out of it.

109. BUTTER. 6. *Putting down.*—The more pure the butter is when put down, and the more perfectly it is afterwards kept from a communication with the outward air, the longer it will retain a ſtate of perfect *ſweetneſs*.

The purity of butter conſiſts in its being free from internal air, moiſture, filth, and a rankneſs of flavor.

The preſervation of butter therefore depends principally on the *paſture* and the method of *making*. If the paſture be rank, whether through *ſoil*, *manure*, or *herbage*, it is generally injudicious to put down butter from it. But if the paſture be ſweet; and the cows be properly milked, the milk judiciouſly ſet, the cream carefully kept and properly churned; and the butter well worked up, with an additional quantity of ſalt; there is little art neceſſary in *putting it down* ſo as to preſerve it ſweet for ſeveral months: nevertheleſs the more judiciouſly it is put down, the *longer* it will retain its ſweetneſs.

There are various veſſels uſed for putting down butter. When a length of carriage is neceſſary, wooden firkins are the ſafeſt: glazed earthenware, however, is preferable when it can be made uſe of with ſafety and convenience: for, out of this, the external air may be entirely ſecluded.

The

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The figure or ſhape of a butter jar ſhould be that of the lower fruſtum of a cone; namely, wider at the bottom than the top: reſembling the ſtanding or upright churn: the top of it being made ſufficiently wide to admit of its being filled conveniently; but not wider.

This form prevents the butter from riſing in the jar, and effectually prevents the air from inſinuating itſelf between the jar and the butter; whoſe natural elaſticity preſſes it in this caſe, ſtill cloſer to the ſides of the containing veſſel: but, were the form of this reverſed, the ſame propenſity of expanſion in the butter would ſeparate it from the ſides of the jar, ſo that towards the top a knife might (as it frequently may) be drawn round between them, and the air of courſe have free admiſſion.

The method of putting it down is this:—The butter having lain in pound lumps twenty-four hours, the dairywoman takes two or three of the lumps, joins them together, and kneads them in the manner in which paſte is kneaded. This brings out a conſiderable quantity of watery brine; which being poured out of the bowl, the butter is beaten with a cloth as before; and the jar having been previouſly boiled, or otherwiſe thoroughly ſcalded, and having

109. BUTTER. having ſtood to be perfectly cool and dry, the butter is thrown into it, and kneaded down as cloſe and firm as poſſible, with the knuckles and the cloth alternately; being careful not to leave any hollow cell or vacuity for the air to lodge in; more particularly round the outſides, between the butter and the jar —and for this purpoſe ſhe repeatedly draws her finger round by the ſides of the jar; preſſing the butter hard, and thereby uniting intimately the jar and butter.

It is fortunate when the jar can be filled at one churning; but when this cannot be done conveniently, the top is left level; and, when the next churning of butter is added, the ſurface is raiſed into inequalities, and the two churnings united into one maſs.

The jar being filled with butter, to within two or three inches of the top, it is filled up with brine; made by boiling ſalt and water (in the proportion of a handful to a pint) ten minutes or a quarter of an hour; ſtraining it into a cooling veſſel; and, when perfectly cool, putting it upon the butter, about one and a half or two inches thick. If a wooden bung be put upon this, and a bladder tied over the mouth of the jar, butter thus preſerved, from a good paſture,

pasture, will remain perfectly sweet for almost any length of time; provided the jars be placed in a *dry* and *cool* situation. 109. BUTTER.

110.

MAY 18. (See MIN. 97). There is not now less than four pounds a head difference between these two parcels of bullocks! yet Mr. ——— is deservedly reckoned a good farmer; and has treated his heifers in the common way of throwing turneps to them; first on his wheat stubbles, and afterwards on his ollands. BULLOCKS AT TURNEPS.

There was one thing, it is true, very much against Mr. ———: his best piece of turneps lay detached from his farm; except from a part which was too wet to be thrown upon; and although he got a neighbour to let him throw upon an adjoining piece of young clover (giving him the teathe for the conveniency), yet he had no other "shift" than that of his turnep-close itself; drawing from one part and throwing upon the part already bared; and this spring being unmercifully wet and cold, the bullocks stood to their dew-claws in dirt; and, what was worse, had no other place to lay down on. This was undoubtedly against them.

Never

110. BULLOCKS AT TURNEPS.

Nevertheleſs it is obſervable, that bullocks in general, this year, have not done better than theſe. Mr. ——'s have not done better: he had three under-done ones "turned out" of Smithfield laſt Monday: and Mr. ——— is not an inferior grazier.

Yet notwithſtanding the badneſs of the ſeaſon, and the much-complained-of badneſs of turneps, this year, Mr. Baker's heifers have done extremely well. For, although they were bought-in on very high terms, they will, if they meet with a fair market, nearly double their firſt coſt.

I have ſtill continued to attend particularly to the fatting of theſe heifers; which was thus conducted. They have had plenty of turneps and a "clean trencher" every day; with plenty of followers to lick up the crumbs; ſo that the fatting bullocks only picked and choſe the prime of the turneps: and in this ſeems to conſiſt the excellency of the management. For theſe heifers were fatted abroad, where they remained night and day; with ſtraw ſcattered under the hedge. Toward the ſpring, however, when the turneps began to loſe their goodneſs, they had *hay* inſtead of ſtraw.

This practice, which is not peculiar to Mr. B. is very judicious; for the bullocks are thereby

thereby led on from turneps to graſs, without receiving a check between them. 101.

BULLOCKS AT TURNEPS.

The above is not the only inſtance of Mr. B.'s ſkill in grazing. Laſt year, he ſold two Galloway bullocks for near fifty pounds.—Theſe, however, he had kept "over-year;"—that is, from October 1779, to May or June 1781; eighteen or nineteen months.

But a few years ago, he ſold in May-June, five Scotch cattle (which he had bought in, at St. Faith's fair, the preceding October) for twenty pounds a piece. The lot conſiſted of ten:—the other five he ſold at ſeventeen, eighteen, and nineteen, pounds each. This half ſcore did not coſt him quite nine pound ten ſhillings a head; ſo that, in about ſeven months, he doubled his money.

BREED OF CATTLE.

But what is ſtill more, about four or five years ago, he bought nine *Iriſh* bullocks at St. Faith's; namely, ſeven at ſeven guineas each, and two at ſix pounds fifteen ſhillings each. Theſe he finiſhed by the beginning of June, and ſold (in Smithfield) four of the ſmalleſt at ſixteen pounds a piece; the remainder at eighteen pounds or upwards. This is probably the greateſt grazing that ever occurred in the county.

Much,

110. BUYING BULLOCKS.

Much, however, may depend on the choice of a bullock for fatting. The Norfolk farmers know, or pretend to know, whether a bullock will *grow* during the time of his fatting; and it is the bullock which grows and fats at the fame time, which leaves moft profit to the grazier. If one may judge from Mr. B—'s fuccefs in grazing, he is deeply verfed in this myftery; indeed, the heifers before-mentioned are a ftriking proof of his judgment in this particular. For they have grown very confiderably, as well as fatted kindly; whilft the principal part of Mr. ———'s, out of which thofe were drafted, feem, as to carcafs, the fame as they were laft October.

A thick fhin is a favorite point in Highland cattle; and there may be other points fymptomatic of a growing bullock; but I am apprehenfive that a good grazier forms his judgment from general appearances, and from intuitive impreffions, rather than from particular marks and figns: and I am of opinion, nothing but continued practice, and clofe attention, can make a man a judicious grazier.

111.

MAY 25. Yefterday Mr. ——— fhewed me another account for eleven more of his heifers,

heifers, which happened to go up to a good market laſt week. They neated 104*l.* 17*s.* 10*d.* ½, or 9*l.* 11*s.* a head. They coſt about 6*l.* 15*s.* and therefore left a profit of 2*l.* 16*s.* a piece, only; but, conſidering the high price at which they were bought in, and the untowardneſs of the ſeaſon, they have not done amiſs. He may thank, however, the fluctuation of Smithfield market. 111. BULLOCKS AT TURNEPS.

The preceding week, there was an uncommonly full market. Smith, alone, drove ſeven ſcore. The demand was glutted and the prices low. (A farmer in the neighbourhood ſent up three, which were ſold for what he had expected for two of them!). This frightened the grazier; ſo that, laſt week, the market was thin, and they ſold well. SMITHFIELD MARKET.

A week or two at the finiſhing of the turneps ſeems to be an injudicious time to ſend bullocks to Smithfield and St. Ive's:—there is generally a glut about that time. If, therefore, bullocks are fit, they ought to be ſent off a week or two before; if not, they ought, if poſſible, to be kept two or three weeks longer.

112.

112. 112.

DISTRICT. MAY 28. Yeſterday morning, ſet out, early, for Ingham fair—by way of the ſeacoaſt.

Made the coaſt at Munſley, and kept it to Haſbro'; ſometimes riding above, ſometimes below cliff.

There being a large fleet of ſhips, cloſe in land, ſteering to the northward, with a gentle breeze upon the quarter, and the morning mild and pleaſant, the ride became delightful; though ſometimes rendered awful by the height of the cliff, and the narrowneſs of the path immediately upon the brink of it; more eſpecially as the cliff itſelf is of an earthy crumbling texture, and liable to "ſhoots," whereby many acres are every year ſwallowed up by the ſea.

SEA-CLIFFS. Mr. Baker (who rode with me) ſhewed me the remains of a field, which men, now living, remember to have been twelve acres; of which there is now only a corner of two or three acres remaining. Had this piece lain parallel with the line of the cliff, every rod of it muſt have long ſince diſappeared.

The loſs is the greater, as the ſoil is rich and prolific in a ſuperior degree. Noble crops

riſe

rise close to the edge of the cliff; except in some places where the sea sand is blown up in too great quantities; which it is, most particularly toward Munsley, where the cliff is not less than one hundred feet high; more than at Hasbro', where it does not rise ten feet from the beach. 1782. SEA-CLIFFS.

In going above-cliff we saw two large heaps of marl, which have been got out of the face of the cliff. MARL.

This, it seems, is a common practice of the farmers whose lands lie next the coast. It is sometimes drawn up by a wince, which they call "davying" it up; or else run up in wheelbarrows, in oblique paths, made in the face of the cliff; in which manner these heaps appear to have been got up: but neither the place where it has been dug from, nor even the path or gangway, except just at the very top, are now to be seen; the whole having, in a few weeks, crumbled into the ocean.

Further along the coast towards Hasbro', the farmers throw up a clay, out of the face of the cliff, which is here very low: and near the village of Hasbro' is found a white brick-earth esteemed the best in the county.

112. I have examined the three different earths, and tried them in acid.

COAST-MARL. The "marl" is a white gritty chalky Norfolk marl; effervescing very strongly.

COAST-CLAY. The "clay" is of a browner darker colour, but interspersed with specks of a white chalky substance: this effervesces very considerably, but not so violently as the marl.

BRICK-EARTH OF THE COAST. The "brickearth" is of a dusky-white, or stone colour. It is less harsh than the other two specimens; easily bursting between the fingers to a smooth impalpable powder; and effervesces strongly in acid. This did not surprise me, as I had enquired particularly into whether it was "good for the land;" for I have not *yet* found a clay which has been set on as a manure with success, which has not been strongly calcareous. I had, however, conceived that bricks could not be made from a calcareous earth. But the fact is, that this earth is calcareous, and that the Walsham brickmakers give 3*s*. a load for it upon the spot, and carry it six or seven miles, to make white bricks and pavements of.

COAST HUSB. The farmer knowing with a degree of moral certainty, that his land next the sea will shoot down into it, why does he not, at once,

cart

cart away the rich top-mould for bottoms of dunghills, &c. and caſt, at his eaſe, the marl or clay which lies beneath it? I ſaw no trace of a regular plan of this kind, either in this ride, or in the journey to Yarmouth. 112. COAST HUSB.

Going below-cliff gave me an opportunity of ſeeing more fully the nature of the marram plant. The leaves proceed from a ſmall crown, from whence, downward, proceeds a long ſimple hollow root, with verticils of fibres at different diſtances, according to the depth; the upper ones being only two or three, but the lower ones eight or ten inches, aſunder. I meaſured one root eight feet long, and I apprehend the length is generally equal to the depth of the ſand-bank. In mowing marram for thatch, the workmen keep their ſithes an inch or more under the ſurface of the ſand. Marram upon a cultivated ſoil (a ditch bank) grows with a broad flat blade, and does not take that ruſhlike form which it appears in upon the ſand-banks. MARRAM.

Norfolk Huſbandry.—In a large incloſure near Ingham were thirty fine Scotch bullocks (belonging to a capital grazier in that neighbourhood); ſome fat, others fatting; weighing from fifty to ſixty ſtone a bullock; conſequently NORFOLK HUSBAND.

112. MARKETS.

worth from three to four hundred pounds.—What a ſight is this in an arable country!

Ingham Fair.—There were three or four hundred head of cattle, and more fat bullocks than there were at Walſham and Worſtead jointly; and theſe, too, finiſhed in a ſuperior ſtyle. The farmers in that country are, like their ſoil, rich; and even now, bad as times are, are ſaid to be getting money.

There were a good many buyers; but the ſellers were unreaſonable in their demands. They did not aſk leſs than five ſhillings a ſtone for beaſt that were tolerable meat. There might be from fifty to one hundred ſold.

Very little young ſtock I apprehend was ſold. There is indeed very little in the county; and, now, the farmers having, from the wetneſs of the ſeaſon, a proſpect of graſs, they are unwilling to ſell, except at extraordinary prices.

A farmer of South-Reps ſold eight two-year-olds, forward in fleſh, and very pretty ones, for 5*l.* 10*s.* a head. This is paying him very well, though they have been at full keep ever ſince they were dropt.

FATTING CATTLE.

It may be ſaid that fatting cattle at two years old is nipping bullocks in the bud; ſo it may; but

but if this farmer, for inſtance, were to keep his bullocks till three years old, he would bring up calves in proportion; ſo that from a given quantity of land the community has the ſame or a ſimilar quantity of beef. 112. FATTING CATTLE.

Ingham fair reaches four or five miles round on every ſide. We breakfaſted at Haſbro', baited at Ingham, and dined at Brunſtead; a circuit which Mr. B. and his friends take every year, among their relations and acquaintances. This ſpecies of ſociability and hoſpitality is not peculiar to Ingham: Walſham, Worſtead, South-Reps, Alboro', St. Faith's, &c. &c. have their fairs, more famed for their hoſpitality than the buſineſs tranſacted at them; except the laſt, which is one of the largeſt fairs in the kingdom. NORFOLK, FAIRS.

Yorkſhire has its *feaſts*; other countries their *wakes*; and Norfolk its *fairs*.

113.

JUNE 1. This morning went to ſee Mr. Baker's ſix heifers go off for Smithfield market with five underdone ſteers of Mr. D. SELLING BULLOCKS.

The heifers are beautiful; one of them more eſpecially: ſhe is "full everywhere"—no point higher finiſhed than another; and is, to uſe the grazier's phraſe, as firm as wax, and

1773.

SELLING BULLOCKS.

appears so compleatly stuffed within, that she seems to walk with difficulty. There is another appears, *to the eye*, to be fatter than this; but she *handles loose*; and will probably waste much in travelling; whereas Mr. B. has no doubt (and he speaks from experience) but that the former will *shew her points* better in Smithfield-market than she does now; adding, that a "right-fat bullock does not shrink in travel-"ling nearly so much as one which is only "meaty."

BUYING BULLOCKS.

Enquiring, of the drover, as to who has sent up the best bullocks this year; he said, that Mr. R——, of R—— Hall, had sent the best lot he had driven this year. Ah! says Mr. B—, "Peter always buys a good bullock. If a man "don't buy a good thing, he can never expect "to have any thing capital; he does not mind "a few shillings at St. Faith's:" adding, that "we think nothing of a difference, at this time "of the year, of three or four pounds a bul-"lock; but look as much at shillings on Fay's "Hill, as we do at pounds in Smithfield."

This dropt spontaneously from Mr. B. and is, no doubt, the principle and grand basis of his own practice. For he always buys the best bullocks he can lay his hands on; and he is,

and

and has been for ſome years, eſteemed very juſtly the beſt grazier in *this* neighbourhood. 113.

BULLOCKS AT GRASS.

It is obſervable that bullocks have got on very faſt at graſs this ſpring. Mr. B. gives for a reaſon, that the weather is cool; and altho' it has been wet, rainy weather does not hurt bullocks ſo much as it does ſheep. Hot weather, he ſays, is the worſt for bullocks; "it "ſets them a-gadding;—makes them cock "their tails and run about the cloſes; and "nothing checks them more."

114.

NORFOLK HUSBAND.

JUNE 1. How helpleſs are the Norfolk farmers on a wet ſoil! If the water do not run through it like a ſieve, they are at a ſtand: if it lodge on the ſurface, they are loſt.

This uncommonly wet ſpring has embarraſſed them. Mr. ———, one of the oldeſt and beſt arable farmers in the neighbourhood, came to me the other morning to deſire I would let him have a little wood to "buſh-drain" a piece of land, which he wanted to ſow with barley; but which he could not get upon; it being under water!

I reaſoned with him on the impropriety of underdraining a piece of land while it lies

114. NORFOLK HUSBAND.

ſopped in wet, and which was to be immediately trodden with the plow and harrow horſes. I could not, however, convince him of his error; and hoping that it might hereafter be of ſome uſe, as well as to prevent a clamour, I this morning went and ſet him out ſome alders (juſt broken into leaf!), and went to ſee his operations; which are in ſome forwardneſs.

The cloſe is nearly a ſquare of ten acres;—lying with a moſt deſirable gentle deſcent; and the little quantity of water, which ſtood upon it, was towards the bottom of the piece; in the place where the waterfurrow is uſually made; but where he is making a trench for a ſub-drain!

SOIL PROCESS.

The ſoil is a ſtrongiſh ſandy loam; lying on a perfectly ſound abſorbent brickearth; but which, from three or four months continual rain, had become ſatiated: and all that could be poſſibly wanted, at preſent, was a ſurface-drain to carry off the ſuperfluous water.

His ſon, who I found was a principal in the buſineſs, though deſervedly eſteemed one of the beſt huſbandmen, of his years, in the county, went with us. He ſeemed to think that the water might have been got off, but then how were they to have plowed and harrowed without

without filling up the drain? I told him, that if he had put one horſe in a plow and drawn each furrow (the ſoil lying in five-pace warps), and afterwards had taken two and cut a deep croſs furrow; then ſet on one man to ſhovel out the crumbs, and another to open the eyes of the interfurrows with a hoe, every drop of the ſtanding water might in a few hours have been got rid of: and,—the land having lain in this ſtate until a day or two of fine weather came—if he had then began to plow on the upper ſide of the cloſe,—and worked towards the outlet, at the lower end of the croſs furrow,—he could have had no more trouble with the ſurface water. 114. SOIL PROCESS.

115.

JUNE 7. Fence walls, carried to a proper height, are warmer and more durable than *battons*; the cuſtomary farm-yard fence of this country (See BUILD. and REPAIRS, Vol. I.). FARM-YARD FENCES.

But, if walls are not raiſed to a proper height, they afford little ſhelter, and are continually liable to be uncoped by the cattle.—The yard of Antingham-Hall farm is a ſufficient inſtance of the former, and various inſtances

115. ſtances of the latter occur on different parts of this eſtate.

YARD-FENCES. A fence-wall to a farm yard ſhould not be leſs than ſix feet high; the coping is then out of the reach of the ſtock. Where dung is laid againſt it, the height ought to be ſtill greater.

Battoning is very expenſive, and frequently out of repair.

Poſts, rails, and kids are, in many points of view, preferable.

116.

BUILDINGS. JUNE 8. It is very dangerous to run up *ſea-ſtone walls* too quick. Mr. —— had one ſhot down the other day at Antingham, and nearly killed one of the workmen. The weather was wet, and the bricklayer run up the wall, at once, without ſtopping, at intervals, to let it ſettle. The ſtones being already ſaturated with wet, could not abſorb the moiſture of the mortar;—the air being alſo moiſt, the mortar, of courſe, remained pappy; and ſea-ſtones, being globular, have no other bond or ſtay than the mortar; which being unable to hold them together, the ſuper-incumbent weight cruſhed down the whole.

Had

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SEA-STONE WALLS.

Had the bricklayer proceeded by ſtages, letting the lower parts get ſufficiently firm before the upper parts had been laid on, the mortar would have had time to ſtiffen, and the wall would have ſtood.

If the ſtones and air be dry, one halt, when the wall is a few feet above the foundation, is generally found ſufficient.

117.

SELLING BULLOCKS.

JUNE 13. This afternoon, went to ſee the Smithfield drover pay off his "maſters," at his chamber, at the Angel, at Walſham (Market-day—Thurſday).

The room was full of "graziers," who had ſent up bullocks laſt week, and were come, to-day, to receive their accounts and money.

What a truſt! A man, *perhaps*, not worth a hundred pounds, brings down twelve or fifteen hundred, or, perhaps, two thouſand pounds, to be diſtributed among twenty or thirty perſons, who have no other ſecurity than his honeſty for their money:—nay, even the ſervant of this man is entruſted with the ſame charge; the maſter going one week, the man the other: but ſo it has been for a century paſt; and I do not learn that one breach has been committed.

The

117. SELLING BULLOCKS.

The buſineſs was conducted with great eaſe, regularity, and diſpatch. He had each man's account, and a pair of ſaddle-bags with the money and bills, lying upon the table: and the farmers, in their turns, took their ſeat at his elbow. Having examined the ſaleſman's account; received their money; drank a glaſs or two of liquor; and thrown down ſixpence towards the reckoning, they ſeverally returned into the market.

Laſt Monday's market being what is called a "whipping market," the room was filled with chearfulneſs and ſatisfaction: there was only one long face in the company. This was a farmer who had ſent up three bullocks, for which he had twentyfour pounds bade at Walſham fair; whereas the ſaleſman's account from Smithfield, notwithſtanding the goodneſs of this week's market, was only twentytwo pounds.

Such is the uncertainty of Smithfield market; and ſuch the misjudgment or partiality of the Smithfield ſaleſmen. If theſe bullocks were worth twentyfour pounds at Walſham fair, they ought, after three weeks or a month's graſs, and conſidering the market and the expences incurred, to have fetched twentyſeven,

twenty-

117.

SMITHFIELD MARKET.

twentyeight, or thirty pounds, in Smithfield; but they will not neat twentyone pounds.—From twentytwo pound, the groſs ſale, deduct the expences, ſeven ſhillings and one-penny half-penny a head; there remains only twenty pounds eighteen ſhillings and ſevenpence half-penny: little more than two thirds of their value.

Laſt week, it is true, this farmer had the beſt end of the ſtaff: four bullocks, belonging to four ſeparate graziers, were ſold in one lot; and the ſaleſman divided the lot equally; though it was allowed that this farmer's bullock was not worth ſo much by two pounds as ſome of the lot!

Mr. Baker received for his ſix heifers.—They ſold uncommonly dear; far exceeding what we had laid them at; for, inſtead of five ſhillings, they fetched nearly ſix ſhillings a ſtone. One of them which we had laid at forty-eight ſtone ſold for fourteen pounds *.

* Among theſe heifers was a ſeventh—a "foul-dugged" one: namely, an open heifer, which had dropt her calf in coming from Scotland; and was given to Mr. B. by one of the drovers, to make him amends for a hard bargain of laſt year: an inſtance, this, of generoſity in the drover.

This heifer was treated the ſame as the other ſix; among which ſhe was fatted; and was, as to fatneſs, on a par with the reſt; was ſomewhat larger; and would, no doubt, *prove* nearly as well: nevertheleſs, Mr. B. knowing

117. SMITHFIELD MARKET.

The underdone ſteers, which went up with theſe heifers, (ſee MIN. 113.) ſold for nothing. They did not fetch above eleven pounds a piece, one with another, notwithſtanding they weighed conſiderably more than the heifers.

This ſhews the abſurdity of ſending bullocks to Smithfield before they be fat: Mr. B.'s were "right-fat," and fetched ſix ſhillings;—Mr. D.'s only "meaty;" and did not fetch four ſhillings and ſixpence, notwithſtanding the extraordinary market.

118.

DISTRICT.

JUNE 17. On Saturday laſt ſet out for the BLOWFIELD HUNDRED, and the YARMOUTH MARSHES, in company with Mr. John Hylton, of Felmingham, who formerly reſided in that diſtrict.

We paſſed through the following Hundreds and Pariſhes.

ing the diſadvantageous predicament ſhe ſtood in, did not lay her at more than ten pound. But following theſe heifers to London, and falling in company (on the eve of the market) with a butcher, to whom he related theſe circumſtances, he got twelve pound ten ſhillings for her: a ſtriking inſtance, this, of the advantage of following bullocks to Smithfield: and, in ſimilar croſs caſes, or when the lot ſent up is extraordinarily large, it may ſometimes be prudent for a Norfolk grazier to attend the market in perſon; but, in general, *perhaps*, it is three or four guineas, and three or four days, *unprofitably* ſpent; provided the grazier can depend upon the *uprightneſs* of his ſaleſman.

IN GOING.				RETURNING.			
HUND.	PARISHES.	SOIL.	HUSB.	HUND.	PARISHES.	SOIL.	HUSB.
North Erpingham.	Gunton Antingham	sandy loam	good	South Walsham.	Marshes Wickhampton Free Thorp	wheat land ditto	middling ditto
South Erpingham.	Felmingham	ditto	ditto	Blowfield.	Cantley	very good	good
	Swanton	light	passable		Hastingham	ditto	ditto
	Scottow	good wheat loam	good		Southwood	ditto, with heath	ditto
	Score Ruston	ditto	very good		Buckingham	wheat land	ditto
	Coltishall	various, and common fields	middling		Strumshaw	ditto, and common	middling
	Belaugh	ditto and ditto	ditto		Lingwood	ditto	ditto
Taverham.	Wroxham	pretty good	middling		Blowfield	good land	good
	Sallhouse	light	ditto		Birlingham, St. A.	tolerable wheat land	ditto
South Walsham	Mousehold Heath	heath	——	South Walsham.	South Walsham	ditto	ditto
	Hemlington	part heath	——		Ranworth	ditto, and marshes	ditto
Blowfield.	Blowfield	good wheat land, and hops	good		Bastwick	ditto	ditto
	Bradstone	ditto	ditto	Tunstead.	Honing	light, and heath	middling
	Strumshaw	various, and common	various		Hoston	heath, and very good	good
	Lingwood	wheat land, and common	ditto		Tunstead	good wheat land	ditto
South Walsham	Beighton	wheat land	middling	South Erpingham.	Scottow* (as before)	ditto	ditto
	Birlingham, St. E.	ditto	ditto		Swanton		
	Moulton	ditto	ditto		Felm. &c.		
	Havergate	ditto	ditto				
	Marshes						

* The lands of Scottow, Score Ruston, Tunstead, Hoston, &c. if one may judge from the present black luxuriant crops of wheat, are nearly equal to those of the Happing Hundred.

118. SOIL OF BLOWFIELD.

The *soil* moſt prevalent in the BLOWFIELD HUNDRED is a rich dark-coloured loam, of a good depth; the farmers plowing from five to ſeven or eight inches deep; and affect to laugh at the ſhallow plowing practiſed by farmers in *this* part of the county.

MANURES OF BLOWFIELD.

There is no *marl* in the Hundred; but, the river Yare running by the ſide of it, the farmers get marl very reaſonably from Norwich; and ſet on about ten loads an acre. Dung they alſo get by water from Yarmouth and Norwich.

HOPS IN BLOWFIELD.

The firſt thing which ſtruck me in Blowfield Hundred was a tolerably large hop garden.

We called upon a perſon in the village of Blowfield; who is owner of this and two or three more patches; he being the principal grower in the pariſh. Enquiring as to the quantity of hops grown in this neighbourhood, he ſaid that, three or four years ago, there were ten acres of hops in the pariſh of Blowfield; which, he added, is more than can be collected in the reſt of the county. At preſent, however, there are not more than five acres, and the quantity is every year declining. Hops have lately been low, and the crops have not anſwered the expence. There are two or three drying houſes in the town, but they are, except one, going to decay.

The

118.

ARABLE MAN. OF BLOWFIELD.

The principal crops of the Blowfield Hundred are wheat, barley, peas, and firſt-year's clover.

The *Wheats* are in general very promiſing, and mark the goodneſs of the ſoil, and the plentifulneſs of the manure of Norwich and Yarmouth.

Saw ſeveral pieces of dibbled wheat, which made an uncommonly beautiful appearance: but the practice is by no means general.

The *Barleys* have alſo a promiſing appearance; and

The *Peas*, which it ſeems are ten-fold more numerous this year than uſual (owing to the preſent low price of barley), are luxuriant and very forward, conſidering the ſeaſon. A large proportion of them "ſet;" that is, dibbled in.

The *Clovers*, where they have taken, are fine; but the *Raygraſs*, in general, hides the ſmall quantity of clover, even of the *firſt year:* and as to *two-years lays*, there is ſcarcely a piece to be ſeen in the whole Hundred: the ſoil is ſaid to be "quite tired" of this crop. The ſeedling-plants are, in general, ſufficiently numerous, and look very promiſing the firſt autumn; but go off in the courſe of the winter.

Their *Turnep* crops, too, have failed them of late. Mr. Batchelor, of Bradſtone, (a ſen-

118. ARABLE MAN. OF BLOWFIELD.

ſible intelligent farmer, at whoſe houſe I ſlept) ſays, that twenty or thirty years ago, he never could get ſtock enough for his turneps: he has finiſhed forty or fifty bullocks in a year: now, he does not know how to buy few enough; and does not finiſh more than twenty or thirty: the roots do not come to any ſize; and have no "tack" or proof in them.

The Blowfield farmers in general fat their *bullocks* in ſheds, or in bins in the yard.

BLOWFIELD BULLOCK SHED.

Some of their *bullock ſheds* are large expenſive buildings. Mr. Batchelor has a very good one: it conſiſts of a center building, thirtyſix feet long, nineteen feet wide, and about eleven feet high to the eaves; with a pair of wide folding doors at each end; and with a leanto on each ſide, the whole length of the building, and eleven feet wide.

The center building is the turnep houſe; the leantos, ſheds for the bullocks; which ſtand with their heads toward, or rather in, the turnep houſe; from which they are parted by a range of mangers only; having the full freedom of breathing in its ſpacious area. By opening the doors at each end, a ſufficient degree of air and coolneſs may be given in the cloſeſt weather; while, behind, the eaves of the ſheds are brought

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BLOWFIELD BULLOCK SHED.

brought down to within five feet of the ground, and are boarded with rough boards (excepting an opening at each end for the bullocks to *creep* in at) to prevent too great a coldneſs in ſevere weather; thus preſerving a due temperature.

This ſhed holds twenty bullocks, ten on each ſide, faſtened by the neck, with chains, ſwivels and rings, playing freely upon poſts, ſeven feet high. At each corner of the turnep houſe is a triangular bin for the topped-and-tailed turneps.

In autumn, the entire building is ſometimes uſed as a temporary barn, for buck, peas, &c. and in ſummer, the center part is an excellent waggon ſhed: had the doors been made a foot and a half higher, it would have been an admirable refuge for loads of corn or hay, in a ſhowery harveſt.

The main building is covered with reed, the leantos with tiles.

At Ranworth I ſaw a ſtill more expenſive bullock ſhed than Mr. B.'s; it being all cloſe boarded and painted: the entrance for the bullocks are folding doors, which ſhut cloſe like the back doors of a barn. The doors to the turnep houſe, however, are I think ſtill ſmaller than Mr. Batchelor's. The conſtruction is

118. nearly the ſame as that of Mr. B.'s, which is a more ſubſtantial though rougher building.

BULLOCKS AT TURNEPS IN BLOWFIELD.

The *turneps* are drawn into the houſe in carts, and ſhot down in the area; where they are topped and tailed.—The roots are given to the fatting bullocks whole; and the tops given to the cows and lean ſtock.

The man who tends the bullocks, tops and tails the turneps; in doing which he uſes a very large knife and fork, made for the purpoſe; it having been found from experience that a man, who ſtands perhaps fifteen or ſixteen hours in a turnep houſe, cannot *handle* them in cold weather without injury to his hands. It is conſidered as a much more ſevere employment than that of drawing them in the field.

YARMOUTH MARSHES.

The MARSHES were a new world to me.—They form a vaſt level, containing many thouſand acres, of a black and ſomewhat moory ſoil; formed, perhaps, originally of ſea mud: it being highly probable that the whole level has once been an eſtuary of the German Ocean.

Until about twenty years ago, this valuable tract lay principally under water; except in a dry ſummer. But during that ſpace of time a number of windmills have been erected, which throw the water into main drains, formed for the

118.
YARMOUTH MARSHES.

the purpoſe. By this means the principal part of the marſhes are freed from ſurface-water early in the ſpring; ſo that cattle may now be turned into them about the beginning of May, and are kept free long enough to permit them, in general, to remain there until near Chriſtmas.

The Marſhes, taken collectively, are, though nearly *level*, not perfectly *ſmooth*; being furrowed into inequalities by ſwamps; which, in their natural ſtate, ſeem to have been the main drains of the mud-banks.

Theſe ſwamps, or "reed-ronds," in ſome places of conſiderable width, are now the main drains to the Marſhes; from the graſſy drier parts of which they are detached by banks of ſoil; which at once ſerve the purpoſes of roads, fences, and embankments.

In the beginning of ſpring, the water is thrown from the grazable parts into theſe reed-ronds;—which, in their turn, are alſo drained; and mown for thatch, hay, &c. ſo that, by the aſſiſtance of the mills, every part of the Marſhes now becomes productive.

The grazing parts are divided into incloſures, of various ſizes and gures, by means of water-ditches, of different widths, from five or ſix, to eight or ten, feet wide.

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These water fences, running in all directions, and being of various widths, makes it probable that the principal part of them were the smaller furrows, or partial drains, which carried off the rains, backwater, &c. in a state of nature.

The inclosures, or "marshes," run from ten or fifteen to forty or fifty acres each; belong to a variety of owners; and are rented by a still greater number of occupiers; almost every farmer, within fifteen or even twenty miles, having his marsh.

The *herbage* of these marshes is various, even in the same inclosure: for the individual marshes are far from being level; they being more or less scooped out into hollows; where the water lodges a considerable time after the higher parts are dry. On these grows a rich luxuriant herbage, composed of the choicest meadow-grasses; while on the moister parts grows a long wiry kind of grass, which I think the marshmen call "flat;" and which the cattle are very fond of. But none of the grasses being yet in blow (the *poa annua* excepted), and the aquatic grass not having yet formed its fruit-stalk (the season being unusually backward), I could not ascertain the species.

Marshworms.—The Marshes are infested by a grub, which last year destroyed many acres of grass,

graſs, by eating off the roots, about an inch below the ſurface. This year, the damage is trifling; there are, however, ſtripes to be ſeen in almoſt every marſh, which look nearly as brown as the ſoil itſelf. The graſs is totally dead; and by ſtriking off the ſurface, with the heel of the boot, the grubs may readily be found. They are from an inch to an inch and a half long, and about the thickneſs of a gooſe-quill. Their colour is a dark duſky brown, with a black head, and two whitiſh lines waving irregularly from the head, along the back, to near the tail. They are generally believed to be the grub of the cockchafer; but I cannot learn that any one has accurately traced the metamorphoſe.

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The *ſtock* of the Marſhes are principally young cattle, lean "Scots," and old and young horſes. There are, nevertheleſs, a conſiderable number of fatting bullocks; and ſome ſheep.

I do not learn, however, that the Yarmouth marſhes are equal, in their fatting quality, to thoſe on the Thames, or to Romney marſhes. Bullocks, nevertheleſs, which have been at turneps, and have had the ſpring bite of clover, receive no check on being put into theſe marſhes; but, on the contrary, get, in a few months, a very conſiderable improvement.

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If they were properly drained from the puddles of ſurface water which ſtand on them till late in the ſpring; their faces ſmoothed by levelling; and kept ſo, by the harrow and roller; their quality might be much improved.

But, as to improvement, they are totally neglected: the cattle are permitted to poach them in winter; and the tuſſocks which they tread up remain ſtumbling blocks to them all the ſummer: while the dung, collected by the marſhmen, is ſold to the upland farmers.

The landlord finds mills, opens the fence-drains, and hangs the gates; the tenant, who generally rents them from year to year, and frequently for only one year, turns in his ſtock as ſoon as the ſurface is freed from water, and keeps them in until the water, or the ſeverity of the weather, obliges him to draw them off.

The ſtock are under the care of *marſhmen*, who live in cottages ſcattered over the Marſhes; —each having his diſtrict, or "level of "marſhes," to look after. His perquiſite is a ſhilling upon the pound-rent, which is ſometimes paid by the landlord; but more generally by the tenant.

The marſhmen alſo keep cows, which pick about in the ſwamps, roads, and unincloſed parts,

in

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YARMOUTH MARSHES.

in ſummer; and for which they mow winter fodder from the reed-ronds, &c. They carry their butter to Yarmouth, and in winter generally ſell their *hay* butter above the market-price of *turnep* butter;—the univerſal produce of the county, in that ſeaſon of the year.

We entered the Marſhes at Havergate, which ſtands on a bold ſwell, from whence there is a very extenſive view of this great level; which, to the left, is terminated by Yarmouth (diſtant about nine miles); to which in ſummer there is a tolerable road, acroſs the Marſhes.

At the foot of the ſwell, the Marſhes commence. For nearly the firſt mile, we rode to our horſes knees in water. This watery part is *common* to Havergate, and there are two reaſons for its being overflowed: It is no perſon's buſineſs to drain it; and, what is remarkable, it lies lower than the middle of the Marſhes; which, it ſeems, is the higheſt, and the beſt, land.

The firſt marſh we entered was Mr. Batchelor's (who went with us). It contains about thirty acres:—his ſtock are ſixteen fine bullocks; but it would carry three or four more; the graſs being now footlock deep. Theſe bullocks were at turneps laſt winter; at clover

in

118. in the ſpring; and are now doing very well.
YARMOUTH MARSHES. Part of them are already ſold to the butcher, and the reſt will be ready by harveſt. This is a fair ſpecimen of the preſent *quality* of theſe marſhes.

We then went over Mr. Hylton's: his ſtock chiefly two-year-olds, and colts; with three or four three-year-olds, which he expects will be finiſhed by harveſt.

We afterwards rode through a variety of marſhes, belonging to their acquaintances and relations; and having ſeen a marſh mill, we made a ſweep towards the middle of the level, and came up at Wickhampton, where the entrance is almoſt free from water.

Marſh mills.—The proprietor of a level of marſhes either builds a mill himſelf, or pays ſo much an acre to a neighbouring mill; which engages to draw off the ſuperfluous water.

The conſtruction of theſe mills, and the principle they act upon, are beautifully ſimple. The body of the mill is built of brick, about twenty feet high, with ſails ſimilar to thoſe of a corn-mill, but ſomewhat ſmaller. Upon the axis of the ſails is fixed a cogged wheel, of about five feet diameter. This turns a horizontal wheel of the ſame, or nearly the ſame ſize;

size; fixed upon the mill-post, or upright beam: which reaches from the top to the bottom of the mill. Near the bottom of this beam is fixed a similar horizontal wheel; which turns a vertical one, fixed to the axis of the efficient wheel. *This*, as to construction, is a small undershot watermill wheel; but, in its manner of acting, is directly the reverse; for instead of being forced round by a weight of water lying above it, it gathers up, by the means of its floats, the dead water among which they work, and forces it up into a drain resembling a milldam. This wheel works in a case of wood or stone, nicely formed to the floats; and at the head of the drain is a valve gate, to prevent the water from receding when the mill stops; it therefore, in every respect, resembles a watermill reversed. 118. MARSH MILLS.

The mill which I examined raised the water about three feet; which is fully adequate to the draining of the adjacent marshes.

119.

JUNE 22. (See MIN. 39.). Yesterday Mr. Robert Bayfield told me, that he has finished the sale of those nine bullocks. FATTING CATTLE.

One of them sold for ten pounds, and the rest for about nine pounds a piece; so that in less

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FATTING CATTLE.

leſs than ſeven months, taking the par of time, they have more than doubled their coſt.

Suppoſe that he kept them, one with another, twenty-eight weeks; and that he cleared four pounds ten ſhillings a head; they paid him three ſhillings and twopence halfpenny a week; which, notwithſtanding the high prices given this year, is great work for a bullock of leſs than forty ſtone; and ſhews, in a ſtriking manner, the value of the Norfolk breed of cattle.

BREED OF CATTLE.

120.

MANURE.

JUNE 30. Obſerving, the other day, a dunghill, which a judicious huſbandman was ſetting about for turneps, covered with aſhes,—I aſked him the reaſon of it. He ſaid, that the muck being pretty long when it was turned over, and the weather ſince having been dry, there was much long ſtrawy muck at the top, and on the outſides, which would have been in the way of the harrow, and would have kept his light land too hollow; he therefore ſet it on fire.—A new idea; and, in this inſtance, well applied.

121.

121.

SUBSOIL.

JUNE 30. It is very obſervable, that after the late cold wet ſpring, wheats on *ſcalds* are affected in a manner ſimilar to what they ſuffer by a dry hot ſummer! looking yellow and puny.

But it has been ſaid, it ſeems, by an old man, who was the oracle of his neighbourhood, that "nothing is ſo cold as ſand wet."

If this be a fact, it may account for this very remarkable incident.

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TURNEP CATER-PILLAR.

AUGUST 8. This year, the ſpring being moiſt and the weather fine, the young turnep-plants got out of the way of the "fly," which uſually attacks them in their ſeed-leaf ſtate, with very little injury; and a fairer proſpect of a general and full crop of turneps has not been ſeen for ſeveral years.

Many farmers had begun to ſet out their plants with the hoe; little ſuſpecting they were throwing away their labor, and putting their crops in the way of immediate deſtruction.

The alarm, in this neighbourhood, was given about a month ago at South-Reps; where an early-

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early-ſown piece of turneps, through which a footpath lies, was obſerved, by paſſengers, to be covered with the ſuſpected flies.

The report of this circumſtance was carried immediately, by a farmer's ſervant, to the coaſt, about Backton and Walcot; where, the turneps being ſtill forwarder, the farmers (who on that part of the coaſt either did not obſerve the flies, or, if they did, were not aware of their evil effects) were buſy hoeing, and received the intelligence with a ſmile; congratulating themſelves on their better fortune; for not a fly was to be ſeen in their fields: but, on turning up the under-ſurfaces of their plants, they found them ſwarming with young caterpillars; and immediately ſtopped the hoe.—In the courſe of ten days or a fortnight the entire ſea-coaſt was ſtripped; and the country in general, if reports may be credited, has already ſuſtained an injury which may be felt for many years.

Notwithſtanding, however, the flies had eſcaped notice on the part of the coaſt abovementioned, they were too numerous and too conſpicuous to paſs unobſerved on other parts of it; more eſpecially about Cromer; where they were obſerved, ſeveral days, before they were

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were seen in this neighbourhood; and where the observations made, this year, strongly corroborate the idea of their being brought across the sea, during a continuance of north-east wind.

Mr. Howse, of Overstrand, (who lives near the beach, and who is a man of good credit) declares, he saw them arrive "in clouds, so as "to darken the air;" and the fishermen of Beckhithe have made the same assertion: while, from the reports of several persons who live upon the coast, they were seen in such numbers upon the cliffs, and in the adjoining grounds, that, being apparently spent with their flight, they might have been "taken up by shovel-"fulls *." Even in the abovementioned foot-path piece at South-Reps, three miles from the sea, they were described as resembling "flights "of bees."

The 28th July, I walked over this piece with Mr. John Baker, its proprietor. In about

* Afterward, hearing a person (unknown) relating this circumstance, I asked him particularly as to the thickness the flies might lie upon the ground; he said, in some places he believed they lay two inches thick; adding, that they might have been raked up into heaps of almost any size. Perhaps, had fire been put to them in this critical state (which perhaps was not altogether a state of rest but of copulation), numbers might have been destroyed.

ten

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ten days after the appearance of the flies, the young caterpillars began to appear on the under sides of the leaves of the plants; and at the time I saw them, which was about ten days more, the plants were entirely eaten up; nothing but the skeleton or stronger fibres of the leaves being left; except upon a small patch or two towards the middle of the close; and except on a border, round the outside, under the hedges, of a breadth proportioned to the height of the hedge or tree adjoining.

On the west side of this close there was a striking instance of this circumstance. One end of the fence is free from trees; the white-thorn hedge, here, rising 10 or 12 feet high: under this part, the border was something more than the height of the hedge. The other end of the fence is full of pollards, with tops from 18 to 20 feet high; and there the width of the border was in due proportion. The first pollard marked the difference with the greatest exactness!

Almost every inclosure has a similar border; and, in some small pightles set round with high trees, the plants have almost entirely escaped.

Large open fields, and smaller inclosures which lie open to the sea-ward, have suffered most.

most.—The hangs of hills dipping from the sea have suffered less;—owing, perhaps, to the flies overshooting them in their flight. 122. TURNEP CATER-PILLARS.

The shade of the trees, or the instinct of the animal, may likewise account for the borders round the inclosures; but why one patch of a field should be less affected than another, seems somewhat mysterious. Perhaps, the insects, being naturally gregarious, may hang together in bodies, even while they are depositing their eggs.

These patches and borders, however, though they escape the fly, do not long escape the caterpillars; for no sooner have they devoured their foster-plant, than they begin to travel in quest of a fresh supply of food; and one side of the piece being finished, they, with a wonderful instinct, travel in bodies towards the other. The whole field being finished, the gateway and the adjoining roads have, it is said with great confidence, been seen black with them.

They seem to neglect entirely the grasses and every other plant, turneps and charlock *(sinapis arvensis)* only excepted. The last they are said to devour with greater avidity than they do the turneps themselves.

Mr. Baker instances a corner patch, which, for want of hoing, had got up almost knee-

122. high: the turneps were much eaten, but the charlocks were ſtripped to the top.

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Various experiments have been tried for their deſtruction.

Mr. Baker tried *lime*, ſowing it in the middle of the night, when the plants were moiſt with dews, but without effect.

He alſo tried *rolling*. This checked them, eſpecially if two or three times repeated, but did not ſave the plants. It is obſervable, however, that the plants under the hedges, though they had been run over two or three times with a heavy roller, did not appear to be injured by the operation.

Mr. Chandler, of Munſley, is ſaid to have tried *ſoot* without effect.

Ducks have been tried by ſeveral, and with univerſal ſucceſs.

Poultry are ſaid to be equally beneficial; and, if one may judge by a ſingle circumſtance,

Rooks are highly ſerviceable. A large piece of turneps lying in an open field has eſcaped in a remarkable manner; it lies near a rookery, which is a general rendezvous for theſe birds; and I recollect to have ſeen this piece, more than once, covered with them.

Where

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Where the plants have been hoed out, many perſons have *handpicked* them; but this is tedious and expenſive, where the numbers are great. I have myſelf counted twenty caterpillars on a plant, not much larger than my hand. Mr. John Joy declares, that he has reckoned "ſixteen ſcore" upon one turnep; but it was a large plant, which had been hoed ſome time.

It has been almoſt a univerſal practice among farmers, when one part of a cloſe was cut off, and the caterpillars were marching to attack another part which was leſs infeſted, to draw a furrow between them, deepening it with a ſpade into a kind of a *trench*, making the ſide towards the plants to be defended as upright as poſſible; or, if the ſoil would ſtand, ſomewhat overhanging, in order to prevent the caterpillars from ſcaling it. This, if well done, had generally a good effect; and it was not uncommon to ſee the bottom of the trench entirely covered with them.

I have ſeen a trench acroſs a gateway between two turnep-pieces for the ſame purpoſe.

Another expedient practiſed by many for checking the caterpillars was, to draw a *cart-rope* over the plants, in order to ſhake them

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off, but I cannot learn that it ever proved effectual.

A laborer tells me, that in the "canker "year," about twenty years ago, the beſt contrivance, that was then hit upon, was a kind of bruſh made of *furze*; by fixing the branches to a long pole or axle-tree, with a wheel at each end, of ſuch a height, that the furze bruſhed the plants without pulling them up by the roots. This not only bruſhed the caterpillars off the plants, but numbers of them were deſtroyed by the prickles of the furze. This, in theory, is very plauſible, and might be good in practice; but I have not ſeen it, nor heard of its being uſed, this year.

The expedient which has this year caught popular attention moſt, is that of bruſhing the plants with twigs of *elder* tied upon a waggon rope.

Yeſterday, having heard much of the ſucceſs of this expedient, I called upon the farmer * who had gained the moſt credit by it, to learn from himſelf the particulars; and to ſee the plants.

The bruſh is judiciouſly made of the ſtraight luxuriant ſhoots of this year, about the thick-

* Mr. Jonathan Bond, of South-Reps.

neſs

neſs of the finger, and from two to three feet long. Theſe are tied upon the cart-rope with rope-yarn, about four to ſix inches apart, and about eighteen or twenty feet long upon the rope. It is drawn by two men, and takes half a ten-pace warp (about a ſtatute rod) at once. The men lay hold near the twigs: —the two looſe ends of the rope being tied together, and drag at a diſtance behind the elder. 122. TURNEP CATERPILLARS.

The circumſtances attending the piece of turneps ſaid to be ſaved by this contrivance, were theſe: part of the cloſe had been ſown early, and the plants were in rough leaf when the yellow flies firſt made their appearance: —the other ſide of it was not ſown until after that time. The forward part being entirely cut off, the ground was plowed and ſown a ſecond time; but the plowing and harrowings did not kill all the caterpillars:—thouſands were ſeen on the ſurface of the ground travelling towards the backward-ſown part; the plants of which had then got to a conſiderable ſize.

The farmer perceiving this, drew a furrow and made a trench between the two parts: and he and his man three times a day (viz. in the

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morning before they went to their day's work, at noon when they came home to dinner, and at night, when they returned from work) drew the elder bruſh over the plants. The piece is about three acres, and it generally employed them about an hour and a half; eſpecially in the morning, when the dew made the elder drag heavy. He has uſed the bruſh about ten days, in which time he has renewed the elder three times; and it is now nearly worn out.

After looking attentively for ſome time among the plants, I ſaw only two caterpillars; and ſo healthy a piece of turneps I do not recollect to have ſeen: they have been ſown only three weeks, yet they are now fit for the hoe.

In riding towards North-Reps, I ſaw a ſimilar machine; but this is made of the rough boughs, not the twigs. It is a large aukward unmanageable thing:—the woody crooked boughs, ſome of them almoſt as thick as the wriſt, drag up or lacerate the plants; whereas the ſtraight twigs, lying flat and evenly upon the ground, ſhake them in a moſt effectual manner, without doing them the ſmalleſt injury; every plant is kept in a quivering motion from the time the rope touches it until it be paſſed by the laſt leaf: and, perhaps, in this conſiſts the merit of the invention.

The

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The received idea, however, is, that the elder is in its nature noxious to the animal. But this I much doubt: indeed, the experiments which I have made convince me that the idea is erroneous.

The evening before laſt, I took ſome freſh elder-leaves, bruiſed them between the hands, broke them in the middle, and put them with a caterpillar into a ſmall tin box: ſhutting it up cloſe with the cover. Yeſterday morning, it was as briſk as when it was put in.

Yeſterday, I took a turnep leaf and whipped it with a twig of elder, and afterwards preſſed them together between the hands for ſome ſeconds, and then put the turnep leaf into a box of freſh-gathered caterpillars. This morning nothing but the fibres were left.

Among another parcel of caterpillars I put a freſh-gathered turnep leaf untouched—another whipped, &c. with elder; and a charlock leaf alſo freſh-gathered. This morning the eldered leaf was not only conſiderably eaten, but one of the animals was repoſing itſelf upon it.

The leaf of charlock had only one perforation:—the untainted turnep leaf had ſeveral.

It ſeems therefore evident that elder, ſo far from being fatal to theſe animals, is not in any

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degree disagreeable to them. The merit therefore of the elder brush (if it has any) lies in its effectually shaking off the caterpillars without injuring the plants.

But it appears to me highly probable, that it was the trench, and not the elder, which saved the plants abovementioned. For if Mr. Thomas Shephard, of North-Reps, be accurate in the relation of an experiment which he made twenty years ago (and I have no reason to doubt his accuracy), brushing off the caterpillars is of little use. He relates, that he had a two-acre pightle run over with a cart rope, day and night, uninterruptedly, for some days, without any degree of success; for, small as the piece was, the plants on one side of it would be covered with caterpillars before the men reached the other side. Indeed, if we observe how soon they begin to crawl after being thrown down, and how fast they travel when upon their legs, it seems very probable, that being shook from the plants they may regain the leaves, so as to begin feeding again, in five minutes. It seems therefore in vain to expect any essential benefit from brushing them off the plants: for while they have life, they will encounter many difficulties to preserve it.

But

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But whether the plants above ſpoken of were or were not preſerved from the caterpillars by the elder bruſh, I am very much of opinion, that in regard to their growth and healthfulneſs, they received ſome benefit from it. The exerciſe of the wind, it is well known, greatly accelerates the growth of turneps; and it ſeems not unreaſonable to ſuppoſe, that the exerciſe of the elder bruſh produced a ſimilar effect. The plants in queſtion are peculiarly fine, and the incident appears to me to be worth preſerving.

Towards the ſea, where the vermin were very numerous, the plants were ſtripped in a few days; ſo that if the farmer had had ſkill, he had not time, to ſave them. His only reſource was, to plow up the ground and ſow it a ſecond time: and it is probable, that two thirds of the turnep grounds, in Eaſt Norfolk, have been ſubjected to this treatment.

But what is ſtill more unfortunate, ſome of the farmers, who plowed up and reſowed, have loſt their ſecond crop; for, being willing to ſave the borders and patches which had fared better than the main body of the cloſe, they left them ſtanding: but the plow and harrow not being equal to the deſtruction of the whole

of

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of the caterpillars, thoſe which ſurvived crawled to the plants which were left; which ſupporting them until the young plants got up, they returned and preſently eat up the ſecond crop.

Some few men are hardy enough to let the ſtalks and fibres remain ſtanding; hoping that they will ſhoot again; and that they may by this means ſave their crops, as well as the trouble and expence of reſowing.

August 15.—In my rides to Wroxham, Baſtwick, Staninghall, and Norwich, this week, I find that ſome hundred acres of turneps have been ſaved by Ducks.

Mr. Samuel Barber had, at one time, upon his farms, at Staninghall and Woodbaſtwick, near four hundred ducks at work: and, thro' their induſtry, has ſaved a principal part of his crop:—had he begun to employ them ſooner, he believes he ſhould have ſaved the whole.

The different detachments (ſome of them near one hundred ſtrong) were kept by a boy or girl. They were regularly driven to water, and reſted three or four times a day: but had no corn nor any other food given them. After having drank, they would diſgorge the caterpillars in great abundance; ſo that they ſoon fell to again, with freſh appetites.

Half

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Half or three-quarter-grown ducks are preferable to old ones, which are lazy, and will ſooner eat the turneptops, than run after the caterpillars.

It is very amuſing to ſee the young ones dart at their prey: theſe, however, when the caterpillars grow ſcarce, take to the turneptops, and after they have reduced the vermin to a certain ebb, do the turneps more harm than the caterpillars themſelves do.

This has been uſed as an argument againſt employing ducks; and, in reſpect to old ducks, it may have its weight: but if the caterpillars are ſo few as to tire the young ducks in looking for them, the plants cannot ſuſtain any material injury from them.

The fact ſeems clearly to be, that where one acre of turneps has been ſaved by any other means whatever (handpicking excepted) an hundred have been ſaved by DUCKS.

Poultry may be equally good (and perhaps without the evil attendant of eating the plants); but their uſe does not ſeem to have been diſcovered, or attended to, until too late.

Alſo, when a piece of turneps has been in danger from the enemy in the neighbourhood; but not already infeſted; cutting a trench has perhaps

122. perhaps been very beneficial: filling the bottom of it with ſtraw, and, when the caterpillars were in ſufficient numbers among the ſtraw, ſetting fire to it, ſeems to be a late, though an ingenious improvement.

TURNEP CATERPILLAR.

TENTHREDO THE TURNIP.

Aug. 20. The firſt of this month I gathered, alive, eight or ten of the yellow flies ſuppoſed to produce the turnep caterpillars, alſo a parcel of the caterpillars themſelves.

The flies were eaſily caught by beating them from the leaf to the ground, where they lie, apparently lifeleſs, time enough to be picked up. Brought them home in a ſmall box, and put them into a drinking glaſs, covered with perforated paper.

Before I could get a third fly into the glaſs, the two firſt, happening to be a male and female, were in the act of copulation; and before I could get in the whole, two more were in the ſame amorous ſituation. The party conſiſting of nearly an equal number of males and females, an almoſt inceſſant ardour prevailed, till the cloſe of the evening; and, ſetting them in the ſun the next morning, their amours were renewed.

Suſpecting them to be of the genus *Tenthredo*, and being willing to diſcover the two ſerrated

ſerrated laminæ mentioned as the diſtinguiſhing character of that genus, I put one of the females to a ſlight degree of torture, expecting ſhe would have unſheathed them as a weapon; but I was diſappointed: I therefore (that her pain might be as momentary as poſſible) ſevered her head from her body; thinking that in the agony of death ſhe might diſcloſe them; but I was ſtill left in the dark: for, to my aſtoniſhment, inſtead of death enſuing immediately the decapitation, her body ſeemed to experience no great degree of inconveniency from it. She ran upon the table. I turned her upon her back: ſhe recovered her legs as nimbly as ever; ſpread out her wings, and actually made an attempt to fly. Three hours after her head was ſevered, her body was to appearance perfectly alive; and how long ſhe lived afterwards I know not; for, conceiving that without the head the body could not be ſenſible of pain, I did not preſerve or deſtroy it.

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My curioſity, however, was afterwards gratified in a manner I had not expected; for putting a freſh turnep leaf into the glaſs, as food for ſome caterpillars which were alſo in it, I perceived one of the female flies peculiarly buſy in examining the different parts of

the

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the leaf; and obſerving her to be partial to a part which was fortunately on the outer ſide of the leaf towards the eye, I took a magnifier, and placing it againſt the outſide of the glaſs, ſaw her very diſtinctly unſheath her inſtruments; inſinuate them into the edge of the leaf, to a depth equal to their fulleſt length; and, having ſeparated them ſo as to form a channel or pipe between them, placed her pubes to the aperture: remained in that poſture a few ſeconds: deliberately drew out the inſtruments; ſheathed them; and immediately went in queſt of another convenient nidus.—Standing by a window on which the ſun ſhone ſtrongly, and holding the ſubject between the eye and the light, I ſaw the operation very evidently.

The inſtruments are brown, reſembling in colour the ſting of the bee, but much finer, and appear to be flatted; but whether they are or are not ſerrated, I cannot be poſitive. In the courſe of two or three minutes I ſaw her make three or four depoſits.

One of theſe flies lived eleven days; other two, eight or nine; the reſt, ſeven or eight days.—The females died firſt.

What their food is I am not certain.—The only thing put to them in the glaſs were green turnep-

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turnep-leaves. I fancied more than once I could perceive them feeding on the finer hairs of the plant; but am not clear as to the fact*.

In the close of the evening they take their ſtand, hanging down their heads, and putting their antennæ down to whatever they ſtand upon; remaining in this poſture, and apparently in a ſtate of ſleep or ſtupefaction, until they become enlivened by the ſun the next morning.

Their fœces are of the colour and conſiſtence of cream, but dry to a white powder.

The female is conſiderably larger than the male, and, when upon the wing, appears to be of a brighter yellow colour.—On examination, however, their colours are ſimilar.

The following is a pretty accurate deſcription of each ſex.

Female Fly. *Antennæ*, or horn-like feelers;—conſiſts of nine joints; the third joint from the head longer than the reſt; meaſure one hundred and twentyfive thouſandths of an inch long; are clubbed; and black.

* I have, ſince, frequently ſeen them drink the ſap oozing out at the end of a broken fibre of a turnep-leaf; and I have, lately, diſcovered that diſſolved ſugar is a favorite food. *Jan.* 1787.

Head,

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Head, with the eyes, and two ear-like appendages, black.

Tentaculæ, or mouth feelers,—four; amber-coloured.—Mouth whitish.—

Wings—four; deflex; thirtyfive hundredths of an inch long; light-coloured membrane, with black nerves. Upper wings with strong, black, clubbed nerves along the outer edges:—under wings, less nervous; projecting one twentieth of an inch behind the apex.

Legs—six; amber; with black feet, and five black articulations. Hind legs, three tenths of an inch long.

Body (from the neck to the apex)—thirty-five hundredths of an inch:—bright orange; except two diamond-shaped scutuli, or patches on the shoulders, black.

Thorax—less than one third of the length of the whole body.

Abdomen—more than two thirds of the body; and fixed to the thorax, *without any insection*. Its form is between the cone and the cylinder (the greatest diameter about half its length) composed of eight segments on the upper side, and six on the under side. Under the two imperfect segments lies the—

Pubes—which opens under the last perfect segment of the abdomen;—and the—

Sting

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Sting *—compoſed of *three* † hanger-like inſtruments, with a ſpiral wrinkle winding from the point to the baſe; making ten or twelve revolutions:—length about one twentieth of an inch. Incloſed in a *ſheath*; opening longitudinally; and reaching from the pubes to near the point of the tail, where it ends in a black ſpeck. This ſheath ſtands edgeway to, and projects ſomewhat below, the body; but is ſituated principally in a receſs in the abdomen.

MALE FLY.—The ſame as the female; except that its antennæ meaſure only one tenth of an inch in length,—its legs twentyfive hundredth,—its body two hundred and ſeventyfive thouſandth,—and except that beneath the two imperfect ſegments lies a plain ſcale, covering the

Penis—which is incloſed in a cloven-hoof-like capſule, which forms the point of the tail.—In the act of copulation the two claws of the hoof expand, and, in ſome meaſure, embrace the female.—The penis is cylindrical, ſhort, and of a tranſparent, cartilaginous, ſubſtance.

* Improperly ſo termed; its uſe not being that of a weapon, but an inſtrument wherewith the female forms her niduſes.

† But ſee forward.

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In copulating, sometimes the male, sometimes the female invites. The male leaping the female; and curling his tail beneath her's; they become united; and, turning tail to tail, remain about a minute in the act.

After separation, the female walks off with seeming unconcern; but the male remains statent for some time. No sooner, however, has he recovered himself, than he begins to dress for another amour, by cleaning and burnishing his body, and antennæ, with his legs; and, in about five minutes, becomes engaged in another embrace.

The CATERPILLAR, when fully grown, is about half an inch long, and one tenth of an inch in diameter near the head; the body being somewhat smaller: twenty legs, six of them long (probably answering to the legs of the fly), and fourteen very short (perhaps, merely adapted to the caterpillar). The entire animal of a jetty black; (except a whitish line on each side, just above the setting on of its legs) with many wrinkles, but without hair.

Having arrived at some certain period of life, it fixes its hind parts to a turnep-leaf or some other substance, and, breaking its outer coat near the head, crawls out; leaving the slough fixed to the leaf.

It

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It is now somewhat diminished in size, being less than half an inch in length, and thick in proportion; its colour, too, is altered from black to a blueish or lead colour; with a black line waving along its back; and with two small black eyes, which now are become conspicuous. It is still covered with wrinkles, and appears in every other respect the same animal as before.

It is entertaining to see (through a magnifier) the caterpillars eat. The avidity and voracity with which they feed are similar to those of a hungry cow turned into a fresh pasture; and the motion of the head and mouth is not unlike that of the quadruped. If a caterpillar begins in the middle part of the leaf, it first takes off the surface, towards it; and does not, at once, break through the leaf; but, having cleared a round part half-way through, it makes a perforation, and presently dispatches the other surface of the leaf: nor does it afterwards eat the two sides together, but grinds them down singly; until having made a circular hole of from one tenth to two tenths of an inch in diameter, it leaves this for another perforation.

It seems probable that these round holes are not the effect of the caprice, but of the

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instinct, of the animal, and that they are intended by nature for the conveniency of the female in depositing her eggs.

When the caterpillar is apprehensive of danger, he coils himself up in a circular form, putting his head and his tail together. If the plant on which he is feeding be shook, he immediately coils himself up and falls to the ground; where he lies to appearance inanimate, until he thinks the danger over; when he unfolds himself, and soon remounts the plant.

August 21. Yesterday morning, going into a field, where some plants which had been stripped by the caterpillars, had been left standing to wait the effect (to observe the progress these plants had made), I perceived some of the yellow flies among them. Being anxious to procure some, I went eagerly to the pursuit, and found them so abundant, that in half an hour I caught near forty, notwithstanding they were remarkably wild. Their alertness struck me; they being now more difficult to take than I had found them three weeks ago. This led me to the idea that they are the produce of the caterpillars which destroyed the plants abovementioned; for the ground

ground being left unstirred, the chrysales met with no interruption, but were left to the bent of their nature.

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Wishing to trace this insect from the egg to the caterpillar state, I this morning took up a small turnep-plant with a ball of earth to it, and put it into a garden pot, set on a saucer of water. Having a number of the flies in the receiver of an air-pump (somewhat bell-shaped, about eight inches high and seven in diameter), I put this over the plant with the flies sticking to it:—they presently quitted the inside of the glass, on which they were resting, for the plant; and the sun being warm, they seemed much delighted with their situation.

I looked with impatience to see the females begin to deposit their eggs, but could only perceive one which seemed any way inclined to the operation, and this did not go deliberately to the edge of the leaf and unsheath her instrument in the manner I had before observed.

August 22.—On Thursday the 15th instant, I put six blue caterpillars (bedewed with moisture exuding from their bodies) into a box, and (by way of drying them and placing them in a state somewhat resembling their state in nature) put some common garden mould to

122. them; covering two of them up with the mould, and leaving the other four uncovered; some of them being upon the bottom of the tin box; some upon a turnep-leaf, also purposely put in the box.

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Friday the 16th.—The whole had disappeared.

Saturday the 17th.—Moving the turnep-leaf, found one under it, alive, but naked.

This morning, to satisfy myself as to the state of the other five, as well as to endeavour to procure a chrysalis, I searched among the mould with the point of a botanic needle; and turning up one, which stuck pretty hard to the bottom of the box, found it crusted with mould on every side, except that which was next to the box; on which there was a hole large enough to see the animal perfectly alive.

Being willing to collect all the authentic information I could, respecting this interesting subject, I went down this day to Beck-Hithe, to enquire of the fishermen, there, whether they had seen the flies arrive in cloud-like flights, as had been reported they did.

Old Hardingham, and his partner, declared to me, and old Gregory had before declared to Mr. Robert Bartram, who went down with me,

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me, that they have this year ſeen repeated flights fly over their heads as they lay at a diſtance from the ſhore:—that they have alſo ſeen them upon the ſea, as well as upon the beach waſhed up by the tide:—and further, that they have ſeen thoſe which the tide had left, begin, on the ſun's ſhining upon them, to crawl; and, having recovered themſelves, afterwards take wing and fly away: and, moreover, ſeem to be of opinion that they ſometimes light upon the water to reſt themſelves, and then renew their flight.

This appearing to me improbable, I have tried the following experiments.—I took one of the flies, and placed it gently on a baſon of water. It lay upon it, with its legs regularly ſtretched out, as if lifeleſs. Having remained in this poſture ſome time, I agitated the water in the baſon: this rouſed it: and, having got its wings ſomewhat wetted, it raiſed its tail, and when the water had ſubſided, very deliberately dried them with its hind legs; which having done, and having otherwiſe properly adjuſted itſelf, it with the utmoſt eaſe took wing, and flew to the edge of the baſon. This experiment I repeated with the ſame reſult.

I then took another between my fingers, in ſuch a manner as not to injure it, and plunged

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it into the water; wetting it thoroughly. Its wings and body being by this means loaded with water, its utmoſt efforts to dry them were in vain:—it ſtill however kept upon the ſurface, and made regular efforts in ſwimming; by which means reaching the water's edge, it crawled out, dried its wings, and took flight, without having received any apparent injury from the ducking.

Thus the fiſhermen may be right: in a ſmooth ſea the flies may reſt themſelves upon its ſurface, and renew their flight; but, being once thoroughly wetted by the waves, they either periſh, or are brought by the wind and tide to the ſhore: where, if alive, they gain foot-hold, dry themſelves, and fly to dry land *.

* Being doubtful as to the genus to which this ſpecies of inſect belongs; and being, *under the above date*, in poſſeſſion of ſome living flies, alſo of ſome caterpillars and chryſales, I embraced the opportunity of conveying one of them in each ſtate to Dr. Morton, (principal librarian of the Britiſh Muſeum, from whom I had been happy in receiving more than one mark of diſintereſted friendſhip) in order that the ſpecies and its hiſtory might be aſcertained; and, towards this intent, *as far as my obſervations had then enabled me*, as well as to apologize in the importance of the ſubject for the liberty I was taking, accompanied them with the *ſubſtance* of the *foregoing* minutes on this ſubject. Dr. Morton was pleaſed to ſhew them

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AUGUST 24.—Being ſtruck with the before-mentioned incident of the fly living ſeveral hours without its head, I this morning, (Sat.) a quarter before ſeven, cut off the head of a female fly, which appeared very briſk and ſtrong, dividing the neck cloſe to the head, ſo as to leave the two black appendages fixed to the body, without maiming the legs. The body immediately recovered its legs, and ſtood as firmly and to appearance as free from pain as if its head had been ſtill joined to it. I turned it on its back in order to view the different parts of it, and left it lying on its ſide; but it preſently ſprung upon its legs, and began to adjuſt and clean its wings with as much dexterity as if nothing had happened to it; continuing in that act for ſeveral minutes; and, when it left off, placed its legs regularly, firm, and upright as uſual.

Mr. John Baker ſaw it at nine o'clock ſtanding in this poſition; and the Rev. Mr. Parkinſon favoring me with a call between twelve and one, ſaw the ſame. It had, however, by this

them to Sir Joſeph Banks, (Preſident of the Royal Society) and, through Sir Joſeph's liberality and diſintereſtedneſs, the letter has the honor of appearing in the Philoſophical Tranſactions, Vol. LXXIII. Part I. for 1783, page 217.

time

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time moved a few paces from its firſt ſtanding-place, and got its head and antennæ, which lay by it, under its body! It continued upon its legs all day, and at bed-time I left it ſtanding.

On Sunday morning, found it in the very ſame poſture. In the courſe of the morning it had a regular diſcharge of the fœces. Wanting the ſtand of the microſcope on which it ſtood, I made it walk onto a piece of writing-paper. This it performed without a ſtumble; and the inſtrument by which I urged it forward having ruffled its wings, it with the utmoſt propriety and compoſure adjuſted them, and took its ſtand as before.

Between four and five on Sunday afternoon, wiſhing to move it more into the middle of the paper on which it ſtood, and being willing to try its ſtrength, I put a large needle under its body, to lift it from the paper: it immediately laid hold of the needle with all its legs, and not only hung to it, but kept itſelf perfectly upright, and might, I believe, have been carried to any diſtance. Replaced it on the paper, when it took its ſtand as uſual.

In the cloſe of the evening it began to drop its body nearer to the paper, reſting its tail upon it: but on examining the other flies in the

the evening, I find that to be the very posture in which they all repose themselves *in the night!*

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Monday morning, six o'clock.—In the same posture; but had moved upon the paper in the night. *In the day*, it stood on its legs as usual! At two in the afternoon Mr. Samuel Barbey saw it.—About five, it cleaned its wings; and this afternoon seemed more alert than it had been since its head had been taken off.

Tuesday morning—As much alive as before. About nine it cleaned its wings, and seemed remarkably brisk. About two, I found it upon its back;—endeavoured to place it upon its legs; but it could not expand them, though it was still evidently alive. Nine in the evening, it appears to be quite dead. But, astonishing to reflect on, this fly has lived upwards of three days without its head! during which time several of its cotemporaries have died with their heads on; so that it may be a moot point, whether cutting off its head shortened or lengthened its days!—Its life must have been merely vegetative; and the care of its wings pure instinct*.

* Wednesday morning, the whole dead, except five or six. Thursday morning, not one alive!

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August 25. This morning, to my great satisfaction, I at last saw another female deposit; and in a different direction to that in which I had formerly seen them. The fly had her tail directed towards me;—the only direction I could see her in. In this point of view I could not see her draw her sting, its edge being towards me; but saw the end of the case open, and, at first, stand expanded; but, as the instrument entered the edge of the turnep-leaf, (which she strode) the sheath began to close; and, having reached her fullest depth, became entirely shut. Having remained a while in this posture, she, with great deliberation, drew out her instrument; and, having resheathed it, stood motionless for some time, as if overcome with fatigue.

She was not less than two minutes in the operation, owing, I believe, to the age and stuntedness of the turnep.

I saw her withdraw her instrument very evidently; but, in the direction of my eye, it appeared single; whereas, in a side view, it had appeared double.

August 26. On Thursday the twentyfirst, gathered ten or twelve caterpillars, one or two of them remarkably long, namely, six tenths or more,

more. All eat till Sunday the twentyfifth.—One left off about noon.—Placed it on a piece of paper, and covered it up with a little dry mould;—it crawled out not apparently by design; but it ſeemed to want more mould to root in: covered it half an inch thick with moiſter mould, taken from the garden (the weather moiſt): it kept moving under the mould for ſome time, but in leſs than half an hour the motion was not perceptible. 122. TENTHREDO OF THE TURNEP.

This morning the mould ſtill undiſturbed. About four o'clock in the afternoon, ſearched for it among the mould with the point of a needle, and found it ſticking to the paper: blew away the looſe mould, which now was become dry, and ſaw the coat perfectly formed, and adhering firmly to the paper.

August 27. On Sunday afternoon, 25th of Auguſt, put three caterpillars to the live turnep in the garden pot; two black, one blue.—One of the black ones ſoon mounted the turnep, but the other ſeemed neither to have ſight nor inſtinct towards it.

Perceiving the blue one near the root of the turnep, in an upright poſture, I apprehended it was alſo going to feed; but on obſerving it more cloſely, I found that inſtead of the head being

1782. being ascending, as I had thought, towards the plant, its head and part of its body was buried in the mould; and, by the motion of the part in sight, I found that it was in the act of burrowing.—In about half an hour it had compleatly buried itself; and had closed up the mouth of the hole so judiciously, that no trace of it remained on the surface of the mould.

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Yesterday morning, eight o'clock, placed three more blue caterpillars on the mould in the garden-pot:—they had remained in a small close-shutting tin box until they were as wet as moisture could make them, and seemed to be almost in a state of dissolution; so that I was afraid to touch them with the pliers. One of them, however, the liveliest, immediately took to the mould, and buried itself in less than an hour; the other two appeared sickly; but at twelve o'clock they had got a considerable way into the ground. About one, their tails were only to be seen: before four o'clock in the afternoon they had compleatly buried themselves.

August 28. Yesterday morning examining the nature of the female instruments more attentively, I discovered *four* hanger-like divisions; not

not only in a fly which I then diſſected for the purpoſe of further inveſtigation; but in the very ſubject from which I wrote the above deſcription, and which I had preſerved; one of the *three* being double.

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They are ſo extremely thin and tranſparent, that without a good light and a ſtrong magnifier, it is difficult to diſtinguiſh between a double and a ſingle *blade*.

I am now, however, fully ſatisfied as to their number and ſituation.——By putting the point of a fine needle into the orifice of the pubes, and drawing it towards the point of the tail, I ſeparated the compound inſtrument into two extremely fine lanceolated laminæ, each of which are evidently diviſible into two ſomewhat hanger-like inſtruments, making in the whole four; one of which is placed on each ſide the pubes, and the other two on its lower margin towards the tail:—when united, they take the form of a lancet.

By cutting off the lower part of the abdomen juſt above the pubes, and drawing the part upon the point of a very large needle, the ſting ſprings out of the ſheath, and is eaſily

122. easily separated in the manner abovementioned.

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The two sides of the sheath are not united at the back, as I had imagined, but are two distinct valves, or pieces, until they incorporate with the coats of the abdomen.

N. B. I have repeatedly dissected the female instrument (by drawing the lower part of the abdomen on to the point of a pair of compasses) for my own satisfaction, as well as that of my friends, and have always found them exactly as above described.

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MARKETS. August 28. Cawston Sheepshow.—This fair is held the last Wednesday in August, for sheep, solely; principally lambs, brought by the West Norfolk breeders, and bought up by the East Norfolk "graziers;" in order to pick among their summerlies, and their stubbles, after harvest; to follow their bullocks in winter; and to be finished, the next summer, on clover, or, the ensuing winter, on turneps.

The West Norfolk ewe-flock farmers also bring their crones to this fair; which the East Norfolk men buy to put to the ram; and, having followed the bullocks and fatted their lambs,

lambs, are themſelves finiſhed for "harveſt beef." Today, there were, alſo, ſeveral pens of ſheerling-wedders, brought by the Weſt-Norfolk farmers, who keep what are called wedder flocks (that is, buy wedder lambs one year, and ſell them as ſheerlings the next), to be bought by the eaſtern or weſtern farmers, to finiſh with turneps, the enſuing winter: alſo conſiderable quantities of ſtock-ewes, two and three ſheer; brought by thoſe who are over-ſtocked, or are throwing up their ewe flock, and bought by thoſe who are increaſing, or "ſetting" a ewe flock.

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Sheep of all ſorts were very dear; nearly double the prices they were laſt year, at this fair. Laſt year, good lambs were bought for five ſhillings and ſixpence, or ſix ſhillings a head: this year, ten to twelve pounds a ſcore was the current price. Mr. Durſgate, who is now, ſince Mr. Mallet's death, eſteemed the richeſt farmer in the county (having, it is ſaid, made thirty thouſand pounds by farming), was bade twelve ſhillings a piece for his whole pen (about three or four hundred): but he refuſed the offer. His and Mr. Martin's (alſo a capital Weſt Norfolk farmer) were the "top of the "fair;" and they both of them aſked four-

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teen pounds. Seven and eight ſhillings were aſked for the diminutive "heath lambs" (from the Brandon ſide of the county), not much larger than rabbits. Laſt year they were ſold at three, or three and a half,—four the outſide price. Notwithſtanding, however, the high prices this year, a principal part of the lambs were ſold.

There are ſeveral reaſons for the high price of Norfolk lambs, this year: the low price which they have borne, for ſome years back, has greatly reduced the ſize and number of ewe flocks; another, there being no market for long wool, while Norfolk wool bears a high price, the Lincolnſhire farmers are getting into the ſhort-wooled breed of ſheep; and have, it is ſaid, bought up conſiderable numbers of Norfolk lambs, and ſtock ewes, this ſummer: and another reaſon, the firſt ſowing of turneps having been cut off by the caterpillar, the ſecond ſowing will produce better food for ſheep than for bullocks.

Stock ewes were ſold from twelve to fifteen ſhillings a head; ſheerling wedders fourteen or fifteen ſhillings; and even a parcel of crones were ſold ſo high as twelve ſhillings, but they were ſingularly good ones; in gene-

ral,

ral, about seven to nine pounds a score; last year they were bought for four to five pounds.

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Sheerling wedders were the cheapest, and lambs the dearest stock. How a farmer could bid twelve shillings for lambs, when he might have bought wedders, of almost twice the size, for fourteen shillings, is somewhat remarkable *.

This is entirely a fair of business: scarcely a woman or a townsman to be seen in it. Many of the first farmers in Norfolk were there today; this being, I believe, the greatest "sheep-show" in the county.

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AUGUST 30. On Sunday the 4th instant put one black and one blue caterpillar into a box with a turnep leaf: the black one died; the blue one laid itself up in a fold of the leaf, which it fixed to the bottom of the box. Last Sunday, the 25th, I fancied I could see the antennæ of the fly playing at one end of the chrysalis; and not being able to see it af-

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* My reasons for giving the minutiæ of the business of fairs appear at the close of the article MARKETS, Vol. I.

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terwards, or to discover any progress which was made, I began to fear that the leaf was too tough for the fly to disengage itself: I therefore, yesterday morning, wetted it with dew, and set it in the sun; but in the evening, perceiving no appearance of life, I cut the chrysalis from the box, and found the animal perfectly alive; not in the state of a fly, but to all appearance in the very state in which it laid itself up. The part of the leaf which lay between its body and the bottom of the box was converted into a fine transparent lamina, and so fast glued to the box that I was obliged to separate them with the edge of a knife; or rather, to cut off the chrysalis coat close to the box (with which the chrysaline matter seems to be incorporated), making a hole in the bottom of the coat. Replaced it as nearly as I could in the position I had taken it from.

This morning, I find, it has got its tail out of the coat, and has given me a full opportunity of examining it. It is still the same blue caterpillar with a black streak down its back; appears quite healthy; and indeed remarkably plump and sleek. I am afraid, however, that by laying open the cell prematurely,

turely, I have cauſed an abortion: it is nevertheleſs a ſatisfaction to know the exact ſtate in which they appear after having been laid up near a month.

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August 31. On Thurſday the 29th, procured a freſh parcel of flies. Yeſterday, put a group of young turnep plants into a garden pot. Today, put the flies under the glaſs-receiver.

Being nearly an equal number of males and females, and having been ſhut up in a dark box for two days, they began, on being placed in a hottiſh ſun, to copulate with a degree of laſciviouſneſs I had not before obſerved. The males not only remained longer in the act (from one to two minutes), but neglecting to dreſs themſelves, in the manner I had before noticed, flew from embrace to embrace, with very little intermiſſion. Three or four couple were generally engaged at once, and the females which did not happen to be in the act were venting their fury on their more fortunate ſiſterhood; half a dozen of them, ſome double ſome ſingle, being frequently engaged at once in battle-royal. Their furor laſted about an hour.

I now put three of the females upon the

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young turnep plants, and ſoon found my expectation gratified in the fulleſt extent; for the plants being ſucculent and tender (the rough leaves about an inch in diameter, and the ſeedling-leaves ſtill remaining), they immediately began to depoſit their eggs. I had put the glaſs over them, leſt they ſhould fly away; but this was unneceſſary: I therefore took it off, and made my obſervations without reſtraint. The leaves were thin and tranſparent; the ſun ſhone full upon them; and the flies were ſo tame that I could obſerve the operation in any point of view I pleaſed: even touching them gently while in the act did not diſturb them. I ſaw not leſs than twelve or fifteen depoſits; and Mr. Robert Bartram calling upon buſineſs, while I was obſerving them, alſo ſaw three or four.

I put them upon the plants between nine and ten o'clock in the morning; and leaving them between ten and eleven, did not return until paſt one, when I found them ſtill buſy in the act of depoſiting. My reſpected and ſenſible friend, Mr. Parkinſon, calling at that time, obſerved two or three operations. They ſoon afterwards, however, began to droop, and entirely left the plants.

I have now no longer any doubt as to the operation,

operation. Having tried the texture of the leaf, and its fitneſs for her purpoſe (by piercing it repeatedly with the point of her inſtrument), and having choſen ſome convenient part on its edge (the choice of which ſeems frequently to puzzle her), the female adjuſts herſelf for the operation, by placing one, two, or three of her feet on the upper, and the reſt on the under, ſide of the leaf; but always claſping it with her hindmoſt legs, without which ſhe cannot, with any degree of conveniency, perform the act.—Having taken her ſtand, ſhe begins to feel for the middle of the edge of the leaf, which ſhe finds by the help of her ſheath, placing one of its valves on one ſide, and the other on the oppoſite ſide, by which means the point of her inſtrument eaſily hits the middle way. She then ſplits the edge of the leaf, and having made a ſhallow fiſſure about twice the breadth of her inſtrument, ſhe begins to inſinuate this downwards, into the margin of the leaf; not in a line perpendicular to the edge, but obliquely backward; ſeldom making an angle of more than 45° with the line of the edge, and frequently of leſs than 20°, running it almoſt parallel with it. Having got the inſtrument to near its fulleſt depth, ſhe

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begins to deſcribe a ſegment of a circle, bringing it round with a ſweep until it almoſt reaches the margin of the leaf on the oppoſite ſide of the orifice; and thus, cleaving the leaf, forms a purſe-like nidus within it.

This creates a work of conſiderable labour, in executing which ſhe employs her four inſtruments with a ſkill and dexterity which is delightful to look on, but difficult to deſcribe. The two in front ſhe makes uſe of as hand-ſaws; while the two hinder ones are employed as ſprings to impel them forward, and make them lay hold of the work. What ſeems to make the operation go on ſmoothly and pleaſantly to the eye, and with apparent eaſe to the animal, is, the manner in which ſhe works her front inſtruments; which are not drawn up and puſhed down together, but alternately, and ſeparately, one of them riſing while the other is preſſed downward; as is evidently ſeen by their wrinkles or ſerratures; eſpecially if viewed through a delicate tranſparent leaf, held between a good glaſs and a ſtrong light.

The nidus being formed, the fly lets her inſtruments recede towards its center, where they remain motionleſs until the time of labour comes on; which is generally many ſeconds, often

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often half a minute, after the nidus is finiſhed: but the body having undergone a ſpaſm-like agitation, the orifices of the pubes and the nidus, which are now intimately connected, become ſwelled out with a ſemi-tranſparent whitiſh matter, which is ſeen to glide ſlowly down between *two* laminæ (ſeparated and formed into a funnel-like pipe), until having got near to their points, it drops from between them, and falls deliberately to the bottom of the nidus; where it plainly ſhews itſelf of an oval form. The points of the inſtruments being ſtill carried farther backwards, until they are ſafely freed from the ovum, they are carefully and leiſurely withdrawn (nearly in the direction in which they were inſinuated); ſheathed; and the operation compleated.

SEPTEMBER 1. To make myſelf completely maſter of this ſubject, I put a fly, this morning, upon the ſame plants I had obſerved from yeſterday; and finding her ſo tame that I could place her on any leaf I pleaſed, and even turn it to the light while ſhe was in the act, I cut off one of the tendereſt leaves, took it between the finger and thumb, placed the fly upon it, and holding them between the glaſs

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glaſs and the light, ſaw five or ſix compleat depoſits in about twenty minutes: all exactly in the manner above deſcribed.

If the fly diſlike the part of the leaf ſhe has begun to work upon, ſhe withdraws her inſtruments, and ſeeks for a more commodious part. Sometimes I have ſeen her begin at an angle, where ſhe had not room for a nidus; at others, the leaf being curled, ſhe has found her inſtruments getting too near one ſide of it; and again, I have ſeen her begin ſo near a former nidus that her inſtrument has broke into it: in either of theſe caſes ſhe deſiſted from going any farther.

It is very obſervable, that ſhe refuſed entirely the ſmooth tender ſeedling-leaves, for thoſe which are rough and apparently more difficult to work upon: but inſtinct, no doubt, and not caſe, directs her in the choice; for the ſeedling-leaves are of ſhort duration, and would probably wither before the caterpillar became perfected.

Today, looking carefully to ſee if I could perceive any progreſs made in an egg which I ſaw depoſited, laſt Sunday, in the edge of the live turnep-leaf, and which I then marked, I obſerved, to my great ſatisfaction, a young caterpillar feeding on the under-

ſide

side of the leaf; and, on examining the edge, attentively, found a number of NIDES; from three or four of which the animals had obviously escaped; they being empty, with a hole on their under side, proportioned to the size of the young animal; and looking diligently, on the under surface of the other leaves, I found four more infant caterpillars. 124. TENTHREDO OF THE TURNEP.

In the afternoon, I discovered a sixth caterpillar, which, I apprehend, had escaped in the course of the day. The flies, I find, were put upon the leaves the twenty-first of August, and it is probable that some of the young caterpillars were perfected, and left their niduses yesterday; so that they remained ten days in the egg-state.

Their form is that of the full-grown caterpillars:—their size, one tenth of an inch in length:—their thickness in proportion:—their colour, a dirty white; except the head, which is of a jetty shining black.

They begin to feed on the under surface of the leaf, as soon, I apprehend, as they escape from their confinement; and some of them were, this afternoon, stout enough to accomplish a perforation.

Being semi-transparent, their food may be plainly seen passing through their bodies: their

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their viſcera appearing to conſiſt of one ſtraight paſſage from the mouth to the anus.

They ſeem to have a perfect uſe of all their limbs and faculties; and cling ſo cloſe to the leaf, that it is difficult to ſhake them off.

September 2. Yeſterday, to try whether it be a univerſal faculty belonging to flies in general to live in a ſtate of diſcapitation, or whether it be peculiar to the Tenthredo of the turnep, I ſeparated the head of a common large blue houſe fly, about a quarter before two o'clock. It immediately roſe upon its wings, two or three inches high, and falling upon its back, ſpun round for ſome time: lifted it up by its legs, and letting it fall, it made uſe of its wings, and lighted upon its feet, on which it now ſtood motionleſs. About ſeven it was ſtill alive. Neglected to obſerve it later. This morning it is dead.

Thus it ſeems probable, that all flies have a faculty of living ſome length of time without the head; but that ſome flies will ſurvive the decapitation much longer than others.

September 2. Today, put a female fly upon a ſucculent leaf of rape (*braſſica napus*). She tried it over and over, both on the ſide and on the edge; but would not attempt to inſi-

nuate

nuate her inſtrument; and flew away from it. Put her immediately upon a young turnep leaf: in three minutes ſhe made a depoſit.—Replaced her on the rape-leaf:—ſhe appeared to be diſguſted; and would not offer to make a nidus:—but ſuffering her to walk on to the turnep leaf again, ſhe ſeemed much pleaſed; and there being a large perforation, ſhe put one foot through the hole, and made a depoſit; the firſt I had ſeen made on the margin of a hole in the leaf. She ſeemed to ſtand awkwardly for the operation; but, nevertheleſs, twiſted her inſtrument in ſuch a manner as to hit the middle of the leaf very accurately.

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Saw the ſame fly, afterwards, make three ſeparate depoſits in the edge of a ſmooth ſeedling leaf; but, perhaps, the edges of the rough leaves were already occupied.

Placed a caterpillar upon the rape leaf; but it immediately walked off:—put it on again, and ſhut them up in a box; it eat very freely.

SEPTEMBER 5. The caterpillar lived upon this leaf until yeſterday noon, when the leaf was become dry.

Put it upon the live turnep to pall its hunger; and then ſhut it up in a box with two very

124. very tender leaves of ſowthiſtle (*ſonchus oleraceus*).

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This morning untouched, except a ſlight raſure on each leaf.—Returned it to the turnep leaf:—it eat immediately.

SEPTEMBER 6. Yeſterday, put two leaves of garden-muſtard and two of garden-creſs (ſmall ſalliading) into a box with a caterpillar, covering it up with the creſs leaves, and laying thoſe of the muſtard at a diſtance. In the evening it had left the creſs untouched, and had got upon the muſtard. This morning found it reſting itſelf upon one of the muſtard leaves; but it had not eaten any perceptible part of it. Put it on to the live turnep; it eat a little, but did not quite finiſh one perforation; it having, I apprehend, almoſt done feeding: this experiment, therefore, is not quite deciſive.

SEPTEMBER 6. This morning, obſerving the ſtate of the nidus which I marked the twenty-fifth of Auguſt, I perceived the young caterpillar had juſt come forth; its tail ſtill upon the nidus. This, therefore, laid in the egg ſtate eleven days.

The nidus appears ſmall, comparatively with the animal; which muſt lie coiled up in a very com-

compact ſtate. The body nearly white, and the head, except the eyes, alſo whitiſh. 124. TENTHREDO OF THE TURNEP.

SEPTEMBER 7. This morning, I find two of the oldeſt of the young caterpillars have ſhed their exuviæ; having left them fixed to the leaf of the turnep. What ſurprized me much was, to find them of a deeper black than they were before they caſt their firſt coat; which had, within this day or two, become blackiſh; but this ſecond coat is almoſt a jetty black.

One of them ſeemed but juſt diſengaged from its ſlough; yet was remarkably lively, and appeared to be feeding; but on touching the leaf ſomewhat roughly, it fell to the ground. This ſomewhat ſurpriſed me: becauſe, before they ſhed their coat, it was almoſt impoſſible to ſhake them off. Small as it yet is, however, it had activity enough to regain the plant in leſs than ten minutes.

They are now ſix days old: one of them three twentieths—the other four twentieths of an inch long.

125.

SEPTEMBER 7. The ſeaſons, during the laſt nine months, have been much behind the ſun. Autumn laſted until the middle of January; SEASONS.

Winter

125. SEASONS.

Winter till the beginning of May; Spring until the month of July: and, now, we are in the height of Summer! I have been ſtrolling about the neighbourhood this morning, and find the farmers in the throng of wheat-harveſt! They did not begin in general, until about a week ago.

Stock remained in the ſtubbles and paſtures until after Old Chriſtmas; ſome until February: indeed the graſs continued growing until December; and a freſh ſhoot was, in ſome places, obſervable in the middle of January.

Daiſies began to appear about Chriſtmas; honey-ſuckles, in general, foliated the firſt week in January; and the hazel catkin, having received no check, began to blow about the ſeventh of January; and, what is extraordinary, continued to blow, in intervals of fine weather, until the beginning of April; until which time the graſſes, and wheats, were entirely at a ſtand, by a ſucceſſion of cold, ſtormy, wet weather; but without much froſt or ſnow.

The uncertainty of ſeaſons in this country will appear by the following regiſter of the advancement of the laſt and the three preceding ſprings.

The

125. SEASONS.

	1779. Surrey.	1780. Surrey.	1781. Norfolk.	1782. Norfolk.
The primrose blowed -	Feb. 7	Mar. 9	Mar. 15	Apr. 10
The hazel blowed -	Feb. 10	Mar. 10	Feb. 10	Mar. 31
The gooseberry foliated	Feb. 20	Mar. 25	Mar. 20	Apr. 1
The fallow blowed - -	Feb. 22	Mar. 30	Mar. 20	Apr. 10
The elder foliated - -	Mar. 1	Mar. 21	Mar. 28	Apr. 23
The wild rose foliated -	Mar. 4	Apr. 10	Mar. 28	Apr. 14
The hawthorn foliated -	Mar. 20	Apr. 18	Apr. 15	May 10
The sloe blowed - -	Mar. 25	Apr. 28	Apr. 17	May 12
The nightingale beg. to sing	Mar. 28	Apr. 24	Apr. 17	May 4
The hazel foliated - -	Apr. 1	Apr. 29	Apr. 21	May 22
The birch foliated - -	Apr. 7	Apr. 30	Apr. 22	———
The elm foliated - -	Apr. 7	May 1	Apr. 23	June 12
The cuckow began to call	Apr. 10	Apr. 23	Apr. 18	Apr. 20
The maple foliated - -	Apr. 12	May 4	May 1	May 26
The cowslip blowed - -	Apr. 20	May 4	———	———
The swallow returned -	May 8	Apr. 23	Apr. 18	Apr. 21
The oak foliated - -	Apr. 20	May 20	May 17	June 4
The ash foliated - -	Apr. 25	May 22	May 29	June 10
The haw blowed - -	May 1	May 25	May 27	June 15
Wheat shot into ear - -	June 1	June 21	June 15	July 2
Wheat harvest in gen. beg.	July 28	———	———	Aug. 29
Turneps in full blow - -	Mar. 25	———	———	May 12

In May, we had loud claps of thunder, with lightning, and a succession of rain and tempest, throughout the month! The farmers were distressed, even upon the light lands of Norfolk, to get in their barley: many acres, probably many hundred acres, were sown in the month of June! In the wet land countries, it is said, a considerable share of the grounds intended for spring-corn could not be sown; and much of that which was got in rotted in the ground.

The summer continued wet (excepting two short intervals) until the twenty-first of August,

125. SEASONS. when the weather took up; and the laſt ten days or a fortnight have been extremely fine and ſummer-like:—foggy mornings and hot parching days:—a finer wheat-harveſt never happened.

But the barlies are ſtill backward, ſome of them quite green,—ſcarcely a ſwath cut in the neighbourhood.—Nevertheleſs, the crops look well; eſpecially the late-ſown ones! a ſtriking proof, this, that the farmer, in his time of ſowing, ought to conſult the *ſeaſon* rather than the *ſun* *.

TIME OF SOWING.

* *October* 10. A piece of barley which fell more particularly under my notice (ſee M. 114.) was ſown the fourth and fifth of June; and was cut the twenty-ſixth and twenty-ſeventh of September: the crop not quite thick enough upon the ground; but remarkable "top-corn!" twenty-eight to thirty or thirty-two grains on a ſpike. And what makes this incident a ſtill ſtronger evidence in favor of attending to the ſeaſons for the proper time of ſowing—this piece of barley, though ſown later by ſeveral days than any other piece upon the farm, was (where it had not been chilled by the ſtanding water) the *ſtrongeſt*, beſt barley upon it. Had this piece of barley been ſown on the ſame days, in an early ſpring, it is more than probable that, inſtead of being the beſt, it would have been the worſt, upon the farm. The ſtoutneſs of the ſtraw, the length of the ears, and the plumpneſs of the grain (a ſpecimen of which I have preſerved) are proofs that it was *ſown in ſeaſon*, the fourth and fifth of June.

For general remarks on this ſubject, ſee *Experiments and Obſervations on Agriculture and the Weather*, p. 171.

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SEPTEMBER 7. Laſt year, I put a ſwarm of bees into a wooden hive, of a particular conſtruction. They took it remarkably well, and, in the courſe of the ſummer, laid up an ample ſtore. But the mildneſs of the autumn, and the length of the ſpring, were fatal to a principal part of the bees in the country; and to theſe among the reſt. Nevertheleſs, through inattention, I let the hive ſtand in its place, with the empty comb in it. BEES.

Paſſing by it on the twenty-fourth of July (the height of ſwarming-time this year!) I ſaw ſeveral bees about the mouth of the hive: but in the evening they diſappeared. Next morning they returned; and, at noon, were followed by a very large ſwarm; which took poſſeſſion of the hive; and, in a few hours, began throwing out the dead, and clearing their new habitation: a work which employed them that and the enſuing day.

Perhaps, this was a ſtray flight, which had ſettled upon ſome neighbouring tree, and the firſt were out-ſcouts, ſearching for a hollow tree, or a fiſſure in a rock.

Or, perhaps, they came immediately from ſome hive in the neighbourhood. I have been

126. BEES.

ſince told that this circumſtance frequently happens; and that it is reckoned unneighbourly, if not unlawful, to let a "dead ſtock" remain upon the ſtand. A labourer, it ſeems, followed one, this year, immediately from his own to a farmer's garden in the neighbourhood.

Theſe are circumſtances in the hiſtory of this petty but pleaſing object of rural economy, which, though they ſeem to be well underſtood, in this part of the kingdom, are not, I believe, generally known.

127.

MANURING GRASSLAND.

SEPTEMBER 7. Laſt year, I made two accurate experiments on the *time* of manuring graſsland. One of them was made the thirtieth of *July*, preſently after the hay had been carried off: the other in *October*.

The firſt was very deciſive: the benefit was evident; though the whole crop was extremely good; at leaſt two load an acre: but, where the dung had been ſet, the graſs was lodged, and the ſwath obviouſly larger than it was on the unmanured parts.

But the benefit ariſing from that ſet on in October was by no means obvious; indeed, on a cloſe

a close inspection, I could not see any shade of difference; although the crop was in this case very moderate; not a load an acre. 127. MANURING GRASSLAND.

128.

SEPTEMBER 7. (See M. 62) Another exceedingly fine ash, which stood in the neighbourhood of that before mentioned, and which had also been disbarked, entirely round, by deer, was blown down by the high winds of last spring. WOODLANDS.

The roots were entirely rotten, and the bottom of the stem appeared, as it lay with its butt on, to be decayed; but the topwood and the bark of the stem had a healthy and sound appearance.

Nevertheless, on cutting it up, the stem proves rotten at the heart, for twelve or fifteen feet up; and is, at the bottom, a mere shell.

Therefore, notwithstanding the ash may appear healthy and flourishing, after it has been barked; it is, nevertheless, decaying in the most essential part; and ought not, in point of profit, to be suffered to stand *.

* The rottenness of this tree could not be owing to a natural decay; as it had every appearance of a healthy, growing tree; and stood in a grove, which probably is not more than fifty or sixty years old; and whose trees, in general, are now in full vigour.

129. 129.

TENTHREDO OF THE TURNEP.

SEPTEMBER 7. The young caterpillars are partial to the leaf they are bred in. Obſerving one juſt excluded from a leaf which is become old, withered, and yellow, with only here and there a green ſpeck; I cut off the part on which it was feeding (thinking that a younger leaf would be more acceptable) and laid it upon a freſh young plant, in ſuch a manner that the animal lay at its eaſe between the two leaves: nevertheleſs, it ſtill kept feeding on the old leaf, for many hours: and, when it left it, did not begin upon the top of the tender leaf, but went down to the leaf-ſtalk. But on reflection, this is in conſonance with nature: the animal had been nouriſhed, while in the nidus, with the juices of the old leaf; and after its enlargement, the ſame juices, and thoſe of a ſimilar nature, were moſt ſuitable to its acquired habit. Inſtinct, therefore, led it to feed upon its foſter plant; and to prefer the rigid to the tender part of the young leaf.

SEPTEMBER 9. The eggs depoſited on Saturday the thirty-firſt of Auguſt, are beginning to come forth today; which is only the ninth day from the time of their being depoſited: the leaves young, healthy, and ſucculent:

culent: there is, however, only one as yet excluded (six o'clock in the evening) and another which seems ready to burst forth:—the nidus, or the under side of the leaf, being swelled to the stretch; and somewhat on one side is a large black speck; over which the leaf has a shining glossy appearance. Cut off the margin of the leaf, and shut it up in a box.

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SEPTEMBER 10. This morning it is come forth, and has eaten a pit in the leaf large enough to bury itself.

Examining the leaves in the garden pot, I find them swarming with young caterpillars, which have been excluded last night; so that ten days may be taken as a mean continuance in the egg-state.

Examining these leaves still further, I perceived one of the animals in the act of exclusion.—Cut off the part of the leaf it was in, and saw it crawl out under the glass. It began feeding in less than two minutes.

Seeing several more in, or near, the same state, cut them off with a pair of scissars, and laid them on a microscope stand, placed in a warm sun. One, whose head was already bared, presently made its escape, and actually fed, or appeared to feed, while its tail yet remained in the nidus.

129. TENTHREDO OF THE TURNEP.

Having not yet had an opportunity of seeing any of them in the act of breaking the shell of the nidus, I began to apprehend that the perforation was made by a simple solution of the leaf, by means of the glutinous moisture with which their heads appear to be covered (and which, no doubt, gives the leaf its glossy transparency); for in the two acts of exclusion which I had seen, the head appeared passive, with its upper part protuberant, and its mouth within the nidus; until bringing its mouth and two of its foremost feet without the orifice, it began to struggle, and soon made its escape. But, casting my eye on a neighbouring nidus, I saw a faint working within it, and presently saw its coat pierced by a tooth, or some other appendage of the mouth of the animal; which was obviously in the act of eating its way out.

Having made a perforation large enough for its purpose, it placed its head in the position above described, as if to rest itself after the fatigue it had undergone in making the doorway. In a few minutes it began to struggle, and having got its fore legs without the orifice, crept out with ease.

I afterwards observed two more perform the same operation, in the same manner, and minuted

nuted them both:—one of them was fifteen and the other twenty minutes, from the firſt viſible act to the final excluſion, namely, about ten minutes in making the perforation, and the reſt of the time in reſting, and in the labour of extricating themſelves. 129. TENTHREDO OF THE TURNEP.

I am clearly of opinion, nevertheleſs, that the moiſture, abovementioned, aſſiſts them materially in the operation, by reſolving the coat of the nidus into a jelly-like matter, ſoft and inviting to the infant tooth; for one which, on being placed in a hot ſun, began to make the perforation before the coat had ſufficiently received its ſemi-diſſolution; that is, before the livid patch was large enough; could not extricate itſelf, but ſtuck with its forehead out; while its tentacula, and fore legs, were bound in by a part of the coat, ſtill green and rigid; and it died in this ſtate.

130.

SEPT. 11. The *Midſummer ſhoot* of the oak, this year, has been more obvious than I recollect to have ſeen it. It has, however, I apprehend, been made much later than uſual: it was not obviouſly general until the beginning of Auguſt. Many oaks have ſhot upwards of a foot in length. WOODLANDS.

The

130. MIDSUMMER SHOOT.

The Midſummer ſhoot and the Midſummer barking time have always ſtaggered my opinion relative to a uniform motion of the ſap, on Dr. Hales' principles: nor have they, I believe, ever been fairly accounted for; but remain an unanſwered argument in favor of a *circulation* of the ſap *.

Being ſtruck with this year's ample ſhoot, I was led into a train of reflection upon this intereſting ſubject.

The ſpring run of the bark and the ſpring ſhoot are the acknowledged conſequences of the riſe of the ſap; but how ſimilar effects ſhould take place about Midſummer, when an *extraordinary* riſe of ſap cannot eaſily be proved, may ſeem difficult to explain.

If, however, we conceive a regularly aſcending ſtream to commence on the approach of ſpring, and to continue riſing, uniformly, until the wane of autumn; and trace, with cloſe attention, the effects which muſt neceſſarily be produced, upon the tree, by ſuch a uniform riſe of ſap; we ſhall find them to be exactly thoſe which annually occur in nature: namely, a ſpring run of the bark, ſucceeded by a ſpring ſhoot, with leaves, &c. a Midſummer run, with a ſucceeding ſhoot, &c.

* The *arterial* ſap, if it may be ſo termed, which flows immediately from the root, is here to be underſtood.

and,

and, perhaps, what every year occurs in a greater or ſmaller degree, a Michaelmas run of the bark, with a Michaelmas ſhoot. 130. MIDSUMMER SHOOT.

This proceſs of nature might be illuſtrated in the following manner.

Suppoſe four elaſtic veſſels to be connected in regular ſeries, with narrow communications between them; each channel of communication being furniſhed with an elaſtic valve, requiring a degree of force to open it: but, being overcome by ſuperior preſſure, its elaſticity weakening, until entirely ſpent.

Suppoſe this ſeries of elaſtic veſſels ſtretched flat upon a table (repreſenting the tree), and covered with a board (repreſenting its bark). This would reſemble the winter ſtate of the tree, when the bark and the wood are in their neareſt degree of contact.

Suppoſe further, a regular ſtream of water to be injected into the firſt veſſel. As the water continued to flow, the veſſel would ſwell; the board be lifted by ſlow degrees from the table; and in this ſtate repreſent, ſufficiently, the *ſpring run of the bark*.

The veſſel being filled to the ſtretch, the firſt valve would begin to yield; the buds of the tree would burſt, the leaves expand, and the *ſpring ſhoot* be protruded.

Bur

130.

MIDSUMMER SHOOT.

But the ſpring ſhoot being compleated; every twig and every leaf having received its limited ſize; and the ſtream ſtill continuing to flow; *a ſecond ſurcharge* naturally takes place; and the bark becomes, a *ſecond time*, ſeparated from the tree.

The ſtream ſtill flowing, the ſecond valve is opened: and a ſecond, called the *Midſummer ſhoot*, neceſſarily follows.

The autumn proving fine, and the current of ſap ſtill continuing to riſe, the ſecond ſhoot arrives at maturity, and *a third overflow of ſap* takes place; the third valve is burſt open, and a third or *Michaelmas ſhoot* is the conſequence.

But winter ſetting in, the ſupply of ſap is ſtopt; and that which has already been raiſed, being ſpent on the younger ſhoots, carried off by perſpiration, or having fallen back again to the root, the bark cloſes upon the wood, and the tree returns again to its winter ſtate.

131.

BUILDINGS.

SEPTEMBER 21. *Hog ciſterns*, in this country, are principally built with bricks and *terrace*. But *this* is expenſive; yet a hog ciſtern is among the firſt conveniencies of a farm-houſe. Wooden veſſels are incommodious, and leaden ones dangerous.

This

This ſummer, a receptacle for water in a brick yard being wanted, I had one built of bricks, laid in *clay*, and ſurrounded with a coat of the ſame material: it holds water perfectly. 131. CISTERNS.

Afterwards, I built a hog ciſtern in the ſame manner. This morning, on enquiry, I find that not only the tenant, but his wife and her maids, are fully ſatisfied with it.

It was built in this manner—A pit five feet and a half long, by four feet wide, and five feet deep, was ſunk in the place moſt convenient to the dairy, kitchen, and hog-yard jointly.

The bottom of the pit was bedded with ſome extraordinarily fine clay, fetched from the ſea-coaſt for this purpoſe; moiſtened and rammed down; and its ſurface ſmoothed over with a trowel. On this flooring were laid three courſes of bricks, in clay-mortar (the beſt of the clay being taken for this purpoſe), and in ſuch a manner, that the joints of one courſe fell in the middle of the bricks of the courſe below; the whole being laid long-ways; not croſſed, in the uſual manner.

The ſides were carried up half a brick thick (that is, a brick in width) with mortar of fine clay; and, in a vacancy left between the brick work and the ſides of the pit, moiſt clay was firmly

131. CISTERNS. firmly rammed: so as to unite as much as possible the bricks, the clay, and the sides of the pit into one solid mass; carrying the brick and clay work up together; and beating back such bricks, into the clay, as were forced forward by ramming.

The cistern, when brought up level with the surface of the ground, measured three feet long, two and a half feet wide, and three and a half feet deep; consequently the surrounding seam of clay is not more than four inches thick; and the stratum at the bottom is about the same thickness.

Above-ground, a nine-inch wall was raised on each side, two feet high, with a gable carried up at one end; and, on these, a span or pitched roof was set, and covered with tyles; the other end being left entirely open as a door-way.

This is an admirable covering for a cistern. A *flap* (whether it lie horizontally or sloping) being continually exposed to the weather, lets in rain-water; soon rots; and, from the manner in which it hangs, is liable every day to be split, and its hinges forced off, by the heedlessness of servants: whereas a *door*, having only a gentle fall, and being always under cover, will last a number of years.

132.

132. 132.

TENTHRED♀ OF THE TURNEP.

SEPTEMBER 21. Yeſterday evening, between five and ſix o'clock, ſaw a young caterpillar ſlip its ſlough. What ſtruck me moſt, was its head being of a ſilvery white; except its eyes (very ſmall), which are black, as was the body. Watched the head to ſee it change its colour. In about half an hour, it began obviouſly to change to a lead-colour: at eight o'clock (two hours and a half) it was become quite dark: this morning it is entirely black.

SEPTEMBER 22.—One of the caterpillars (full ſeven tenths of an inch long) excluded the firſt of September (the only one living) took ground today: exactly three weeks from the firſt excluſion (two hours and a half in burrowing).

It ſhed its coat about the ſeventh, and another time, laſt Friday, the twentieth; and probably another intermediate time, about the thirteenth: for thoſe excluded the ninth ſhed theirs about the fifteenth, and are now ſhedding them a ſecond time:—four ſlipped yeſterday; three today:—one of them I ſaw ſlip its ſlough:—the head white as above mentioned.

SEP-

132. TENTHREDO OF THE TURNEP.

SEPTEMBER 23. Thoſe excluded the ninth began to ſhed their laſt coat laſt night (five [illegible], which is only nineteen days from their exclusion. But they have been ſhut up in a warm box, and regularly fed.

Theſe, I am poſitive, have ſhed their coats three times, at about ſix days diſtance.

Put them upon a pot of mould:—they would not take it, nor would they eat; but ſeemed deſirous of being releaſed from their confinement. I therefore gave them their liberty. They were remarkably active; crawling much faſter now than at any preceding period of the caterpillar-ſtate. Hitherto their buſineſs of life has been eating; now, they are in a buſtle to provide themſelves convenient lodging-places.

OCTOBER 16.—To try whether rain, or other water, coming in contact with the chryſaline coat, injures the animal; or, whether the coat is water-proof; I ſuffered a caterpillar to burrow in a garden pot, and let it remain about thirtyſix hours undiſturbed. I then watered the ſurface plentifully, almoſt covering it with a ſheet of water, and put a quantity into the ſaucer on which it ſtood. This

I have

I have ſeveral times repeated; ſo that if the coat be not water-proof, it muſt in this time be injured, and the animal drowned.

132. TENTHREDO OF THE TURNEP

Searched for it this morning (Mr. Parkinſon preſent); found it intire, and the coat as firm and as tough as parchment, notwithſtanding the mould round it was in a ſtate of mortar. Put it into a glaſs of water to waſh off the looſe mould; the chryſaline coat now ſhewed itſelf of a delicate ſilky texture, and of a cylindrical form; rounded at both ends, which were perfectly cloſed and exactly alike.—With ſome difficulty (occaſioned by its toughneſs and tightneſs) I made a breach at one end; and found the animal perfectly alive, perfectly dry, and of a healthy appearance.

The ſeaſon being now far ſpent, I deſpair of ſeeing any of the chryſales come to the fly-ſtate this autumn: their preſent ſtate is this:

That laid up in the fold of a turnep-leaf the fourth of Auguſt, ſtill retains its plumpneſs and curvature; and ſtill, I apprehend, retains its chryſalis life.

Of the ſix laid up the fifteenth of Auguſt among mould, four now remain fixed to the bottom of the box.—On ſeparating one of them, I find the coat very tender and ſomewhat

132. TENTHREDO OF THE TURNEP

broken, with only the ſkin of the animal remaining; not entire, but divided longitudinally; one of the diviſions, or ſides, being very entire, the other broken. *Query*—Has the fly eſcaped from this unnoticed (for during the firſt two or three weeks the box was frequently left open to receive the rays of the ſun); or has ſome other animal entered the coat, and devoured the entrails of the caterpillar? —Looſening another, I find it very perfect, containing a plump, ſleek, healthy-looking chryſalis.—Separating a third, it proves a fine large coat, curiouſly lined on the inſide, with a ſmooth ſilvery lamina; but without any remains whatever of the animal, which has obviouſly eſcaped through a perforation at one end of the coat. *Query*—Did it eſcape in the caterpillar or the fly ſtate? I am of opinion it made its eſcape preſently after it had formed its coat, and was that which I found under the turnep-leaf (ſee back); for there were only ſix caterpillars put into the box, and there have been ſix coats formed: it is, therefore, probable, that each formed its reſpective coat, and that two of them made their eſcape. The other coat, ſeemingly perfect, and, I apprehend, containing a chryſalis, ſtill remains fixed to the bottom.

That

That formed the twenty-fifth of Auguſt, with mould upon a ſlip of paper, ſtill remains a perfect coat, adhering cloſely to the paper.

132. TENTHREDO OF THE TURNEP

Thoſe which burrowed in the garden-pot: while warm weather continued, the pot was placed in the ſun: it has ſince ſtood near the fire; ſo as to receive a conſiderable degree of warmth; but nothing, I believe, has yet come forth. Two or three of them being marked, I have ſearched for them, by digging up the earth carefully, and breaking the lumps between the fingers: this I have found a nice and difficult buſineſs, and the firſt I unfortunately cruſhed between my fingers.

On ſeparating and adjuſting the parts, however, I can clearly perceive the head with its antennæ folded back; its palpi, and legs, perfectly formed; its ſcutuli (or black ſhields upon the ſhoulders) of their full ſize and proper colour; as is the head; but the antennæ and legs and palpi are ſtill white, and appear limber, and not yet hardened. I cannot, however, find any traces of wings: there are ſome fragments of a hardiſh ſubſtance; green within, and brown without; which may be the wings ſtuck to the ſlough of the caterpillar; but I am not certain.

132. TENTHREDO OF THETURNEP

Being willing to ſacrifice another to my curioſity, I have ſearched for and found another coat; but only one-half of the ſlough of the caterpillar remains; divided longitudinally as before.

The garden-pot now contains—one burrowed on Sunday twenty-fifth of Auguſt; one on Monday twenty-ſixth of Auguſt; and three or four which have burrowed ſince that time, not minuted. I now put the pot by, with the glaſs over it to prevent eſcapes *.

From theſe circumſtances, from the freſh ſlight of flies which appear to ſpring up in the middle of ſummer, as well as from the aſſertions of more than one farmer, who ſay, that having ſhut the caterpillars up in boxes they came to flies (the particulars I have not learned); it appears to me more than probable, that the early broods paſs through the ſeveral changes, and arrive at the fly-ſtate, in the courſe of the ſummer: while, from the ſtate in which ſeveral of the chryſales above-noticed ſtill remain, as well as from the ſcattered flights of flies which every year are obſerved to make their appearance in the ſpring,

* Leaving the country a ſhort time afterwards, I had not an opportunity of noticing the event.

it

132.
TENTHREDO OF THE TURNEP

it appears to me equally probable that the latter broods lie in the chryſalis ſtate through the winter; and that ſuch as eſcape deſtruction from birds, inſects, and the uncertainty of ſeaſons in this climate, riſe in the fly-ſtate the enſuing ſpring. Further, it ſeems probable, that in the more northern climates, where the ſummer is ſhort, the entire brood lie in the chryſalis-ſtate through winter; which being rigid, and the ſpring uſually ſetting in abruptly, the chryſales are locked up free from injury, and the flies at once riſe upon the wing; forming thoſe cloud-like flights, which, when the wind happens to blow a ſufficient length of time invariably from the north-eaſt, have been ſeen to arrive, or which may with every degree of probability be brought, upon the eaſtern coaſt of this iſland.

It is, I believe, known that Tenthredos in general are gregarious; hanging together in flights: from repeated obſervations I know that the ſpecies under conſideration will live from five to ten days without food.—The diſtance from the ſouthern cape of Norway to the coaſt of Norfolk is not five hundred miles.—It has been calculated that a balloon has been carried, *by the wind alone*, at the rate,

132. TENTHREDO OF THE TURNEP

of fifty miles an hour; conſequently, a flight of inſects, even ſuppoſing them to make no uſe of their wings to impel them forward, might be brought from Norway to this coaſt in ten hours. In one week they might, provided their wings could bear them, be brought to us from the moſt eaſtern confines of the Ruſſian empire.

If no exotic flights arrive, the few which ſurvive the winter, here, eſcape in a manner unnoticed, and the plants receive no perceptible injury: but, when to theſe the foreign ſwarms are added, their progeny become too powerful for the plants; and the devaſtation becomes conſpicuous and alarming; producing that dreadful calamity to this country, "A CANKER YEAR *."

* Were an apology for the length of this and the foregoing Minutes on this ſubject to be required, I ſhould make the following: Finding, on the peruſal of theſe Minutes, that I was poſſeſſed of a minutial detail of facts, relative to the hiſtory of an inſect, which has been imperfectly attended to by naturaliſts; but which is of the greateſt importance to the agriculture of this country; more eſpecially of the Diſtrict whoſe practice I wiſh to deſcribe with accuracy and minuteneſs; I did not heſitate in my determination to publiſh them entire. I determined with greater readineſs as I have found, ſince thoſe obſervations were made, that the deſtruction cauſed by this alarming inſect, has, in ſome well-cultivated diſtricts, thrown

133. 133.
WHEAT.

OCTOBER 16. (See MIN. 13.) To endeavour to aſcertain the truth of this opinion, I had a ſmall buſh of the *berbery plant* ſet, in February or March laſt, in the middle of a large piece of wheat.

I neglected to make any obſervations upon it until a little before harveſt; when a neighbour (Mr. John Baker, of South-Reps) came to tell me of the effect it had produced.

The wheat was then changing, and the reſt of the piece (about twenty acres) had acquired a conſiderable degree of whiteneſs (white wheat); while about the berbery buſh there appeared a long but ſomewhat oval-ſhaped, ſtripe, of a dark livid colour, obvious to a perſon riding on the road, at a conſiderable diſtance.

The part affected reſembled the tail of a comet, the buſh itſelf repreſenting the nu-

thrown a damp upon the cultivation of a valuable object of rural economy, which will not readily be removed. And I flatter myſelf that the expedients, here regiſtered, for checking or removing the evil, will not be leſs uſeful to the agricultor, than a ſedulous adduction of facts, relative to the migration and propagation of inſects, will be intereſting to the admirers of the economy of nature.

133. BERBERY PLANT.

cleus; on one ſide of which the ſenſible effect reached about twelve yards; but on the other, not more than two yards; the tail pointing towards the ſouth-weſt: ſo that probably the effect took place during a north-eaſt wind.

At harveſt, the ears near the buſh ſtood erect, handling ſoft and chaffy; the grains ſlender, ſhrivelled, and light.---As the diſtance from the buſh increaſed, the effect was leſs diſcernible, until it vaniſhed imperceptibly.

The reſt of the piece was a tolerable crop; and the ſtraw clean, except on a part which was lodged; where the *ſtraw* nearly reſembled that round the berbery; but the *grain* on that part, though lodged, was much *heavier* than it was on this, where the crop ſtood erect.

The grain of the crop, in general, was thin-bodied; nevertheleſs, ten grains, choſen impartially out of the ordinary corn of the piece, took twenty-four of the berberied grains, choſen equally impartially to balance it! ſo that, ſuppoſing the crop in general to be worth five pounds an acre, the part injured by the berbery would barely be worth forty ſhillings; the quality, as well as the quantity, being much inferior.

To try whether the vegetating faculty of theſe grains was deſtroyed or not by the damage

damage the farinaceous part of them had received; I ſowed, Wedneſday fourth of September, three grains of the heavy, and as many of the light, in a garden-pot. Thurſday nineteenth of September, one of the light grains came up; but none of the other until Thurſday the twenty-ſixth, when one of the heavy ones made its appearance: and on Tueſday ſecond of October, another of the heavy grains broke ground. 133. BERBERY PLANT.

To-day, turned the mould out of the pot: found the other heavy grain, and *one* of the light ones; both of them ſprouted.

It is, therefore, proved that, notwithſtanding the injury done to the farinaceous part of theſe grains, their vegetative virtue is not *wholly* deſtroyed.

134.

October 26. *Bullock-fair of St. Faith's.* Bullocks, this year, have been dearer than they were even laſt year (ſee Min. 27.). The firſt day of this fair (the 17th inſtant), ten to twelve pounds a head was aſked for bullocks; but good ones have ſince been bought for ſeven to nine pounds. Bullocks which will fat to fifty ſtone, may now be bought for ſeven pounds. MARKETS.

This

134.
FAIR OF ST. FAITH'S.

This morning, I saw ten two-year-old Isle-of-Skys, drawn out of a lot of two hundred, at two guineas and a half a-head. Very small: not larger than the ordinary yearling-calves of the larger breeds of cattle.

135.

FENCES.

October 28. This morning, I observed some workmen fencing a rickyard with furze faggots, alone:—a species of fence I have not met with before.

In a trench about eighteen inches wide, and six inches deep, they set the faggots, as close as possible, upon their ends; spreading the bottoms; and covering the skirts with the loose mould dug out of the trench; also with that of a narrow trench (a spade's width), dug for the purpose, on each side; treading the mould firm to the roots of the faggots; which being sufficiently loaded, the trenchlets were shovelled and the banks smoothed.

One of the labourers says, he has set a furze-fence in this manner across Gresham field (an exposed situation) which has stood one or two winters.

Calculate the expence thus:—One hundred and twenty faggots set about eight rods; expence

pence of cutting two ſhillings and ſixpence, or about fourpence a rod. Expence of ſetting about threepence a rod more: together ſevenpence a rod. 135. FURZE-FAGGOT FENCE.

The value of the furze, after having ſtood a year, will be about ſix ſhillings a hundred; or ninepence a rod.

Furze faggots, thus placed, are a fence againſt every kind of ſtock; even hogs and hares; and, in a country over-ſtocked with the latter, might frequently be uſed as a temporary fence with great advantage.

136.

OCTOBER 31. Yeſterday, procured the following particulars of the expences upon Norwich marl, brought round by Yarmouth, and landed at the ſtaiths, at Wood-Baſtwick. MARLING.

Coſt of a chaldron (*weighing* a chaldron of coals) at Thorp, and putting it on board the lighters eightpence; lighterage to Wood-Baſtwick, round by Yarmouth, fifty miles, ſixteenpence; together, two ſhillings a chaldron. Two chaldrons make a middling cart-load; two chaldrons and a half a good load: ſeven or eight large loads are eſteemed ſufficient for an acre; the expence upon which ſtands thus:

The

136. MARLING.

	£.	s.	d.
The marl, (ſuppoſe eighteen chaldrons) at two ſhillings - - -	1	16	0
Filling it at the ſtaith; carting to a medium diſtance, and ſpreading about, fifteenpence a load, -	1	2	6
Expence per acre, - - -	£.2	18	6

With the marl ought to be, and frequently is, laid on a quantity of Yarmouth muck, equal, in expence, to the marl.

After this dreſſing, for about ten years, the ſoil (a ſandy loam, but ſtronger and deeper than the Norfolk ſoil in general) throws out very great crops; and, with the uſual teathe and ordinary dungings, will feel the effect of the marl for ten years longer.

Before the uſe of marl (which has not been brought by water, I apprehend, above ten or fifteen years) the farmers could grow no turneps; the land letting for ten or twelve ſhillings an acre: now the turneps upon it are remarkably fine; and the land lets at full twenty ſhillings an acre: a rent the occupiers could not pay, were it not for marl.

WATER CARRIAGE. The diſtance between Wood-Baſtwick and the marlpits at Thorp next Norwich, is not, by

by land, more than six or seven miles; yet the farmers find it cheaper to fetch their marl fifty miles by water, and then carry it, perhaps, half a mile from the staith to the ground, than fetch it these six or seven miles by land. What an advantage, *in some cases*, is water carriage to a farmer; and, consequently, to an estate. 136. WATER CARRIAGE.

137.

October 31. I have lately obtained the following particulars respecting the recent *inclosure at Felbrigg*. INCLOSURES

Some seven or eight years ago, Mr. Wyndham, who is Lord of the Manor, was also (in effect) the sole proprietor of this parish; excepting one small farm, of seventy pounds a year, belonging to a young man, a yeoman, just come of age.

An extensive heathy waste, and some common-field lands, were desirable objects of inclosures: consequently, the possession of this young man's estate became an object of importance to Mr. Wyndham.

Steps were accordingly taken * towards obtaining the desired possession: not, however, by

* Through the mediation of Mr. Kent; whose ability as an estate agent, is deservedly applauded in this District.

threats

137. INCLOSURES

threats and ſubterfuges, too commonly but very impoliticly made uſe of upon ſuch occaſions; but by open and liberal propoſals to the young man, the joint proprietor; who was made fully acquainted with the intention; and frankly told, that nothing could be done without his eſtate. He was, therefore, offered, at once, a ſpecific and conſiderable ſum, over and above its full value to any other perſon: and, to enſure the object in view, he had, at the ſame time, an offer made him of a conſiderable farm, on advantageous terms.

The young man, being enterpriſing, and his little eſtate being, I believe, ſomewhat encumbered, accepted the offer, ſold his eſtate, and agreed for a farm;—conſiſting partly of old incloſure;—in part of common-field land; and, in a ſtill greater proportion, of the heath to be incloſed.

Mr. Wyndham (whoſe virtues and abilities are publicly known) having thus (*in effect as to this incloſure*) got the entire pariſh into his poſſeſſion, and having ſet out the leaſt fertile part of the heath, as a common, for the poor to collect fireing from,—he parcelled out the remainder to different tenants,—laid out roads and driftways, and divided the whole, whether heath

heath or common field, into inclosures of eight to twelve acres each; or agreeably to the desire, or conveniency, of the intended occupiers.

137. INCLOSURES

A principal part of the heath land was laid to the farm of Mr. Priest, the young man above mentioned; and was let to him on the following terms.

Landlord agreed to raise fences, hang gates, build a new barn upon a large scale, make other alterations, and put the whole of the buildings into thorough repair.

The tenant agreed to marl twenty acres every year, until the whole should be marled, at the rate of twenty cart-loads an acre.

The rent agreed upon was this. Nothing, until it has been marled three years. The fourth year, after marling, the rent to commence at three shillings an acre: at which to continue four years; and then (namely, the eighth year after being marled) to rise to seven shillings and sixpence an acre: and at this rent to remain until the expiration of the term of twenty-one years.

It was also further agreed that the tenant should be paid for the carriage of the materials of the new barn; but should do that for the repairs and alterations, gratis; as also for the subsequent

137. INCLOSURES

ſubſequent repairs during the term. Alſo that tenant ſhould pay half the expence of workmen's wages for the ſubſequent repairs; provided that ſuch moiety do not exceed five pounds in any one year.

This was a liberal agreement on the part of the landlord, and, on a curſory view, may ſeem to give extravagant encouragement to the tenant. The following calculation, however, will ſhew that, in the end, the plan will turn out highly advantageous to the landlord.

Suppoſe, for the ſake of calculation, the quantity of heath land, let to this tenant, to be exactly three hundred acres: and that theſe three hundred acres are divided into thirty incloſures of ten acres each; with a public road, or a driftway, between each line of incloſures. This is ſufficiently near, if not exactly, the fact upon Felbrigg-Heath.

In this caſe, every incloſure required to be fenced on three ſides.

Ten acres contain one thouſand ſix hundred ſtatute rods. The ſquare root of one thouſand ſix hundred is forty; conſequently each incloſure, ſuppoſing them to be exactly ſquare, required one hundred and twenty ſtatute rods of fencing.

The

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The price given for ditching, planting the quick, and hedging, was eighteen pence each long rod, of ſeven yards. An hundred and twenty ſtatute rods contain about

95 long rods, which, at 18*d.* is	-	7	2 6
4,500 quickſets, at 3*s.* 6*d.*—15*s.* 9*d.* —furze-ſeed, 4*s.* 3*d.*	- -	1	0 0
	£.	8	2 6

For fencing 30 incloſures, at 8*l.* 2*s.* 6*d.* each, reckon	- -	250	0 0
— 50 gates, with poſts, irons and hanging	- - -	50	0 0
— the barn (very ſpacious) ſuppoſe		200	0 0
— additions, alterations and repairs		100	0 0
	£.	600	0 0
— compound intereſt on this ſum, in 21 yearly payments at 4 per cent.		700	0 0
	£.	1300	0 0

The rents to be received, during the term, ſuppoſing twenty acres to be marled yearly, would be theſe:

137. INCLOSURES.

1	year	-	0	0	0	Forward	153	0 0
2	——	-	0	0	0	12 year -	49	10 0
3	——	-	0	0	0	13 —— -	57	0 0
4	——	-	3	0	0	14 —— -	64	10 0
5	——	-	6	0	0	15 —— -	72	0 0
6	——	-	9	0	0	16 —— -	79	10 0
7	——	-	12	0	0	17 —— -	87	0 0
8	——	-	19	10	0	18 —— -	94	10 0
9	——	-	27	0	0	19 —— -	99	0 0
10	——	-	34	10	0	20 —— -	103	10 0
11	——	-	42	0	0	21 —— -	108	0 0
			153	0	0		967	10 0

As the compound intereſt of the above receipts ſet down - - 232 10 0

£. 1200 0 0

Thus it appears, from this calculation, that on the ſuppoſition of the articles of agreement being ſtrictly adhered to, the landlord will be paying at the expiration of the term one hundred pounds as the purchaſe-money of three hundred acres of *improved land*, worth from ten to fifteen ſhillings an acre; the principal part of this allotment being a good loam, lying on the deſirable ſubſoil, an abſorbent brickearth.

But

137. INCLOSURES.

But the fact is, and was probably foreſeen, that the tenant, inſtead of marling twenty acres annually, according to the letter of the agreement, marled, I think he told me, upwards of one hundred the firſt year, and has now nearly finiſhed the whole.

Therefore, ſuppoſing the original ſix hundred pounds, and the firſt ſeven years intereſt, to have been taken up, the landlord would, at the end of the term, have cleared off the incumbrance, and have found ſome hundred pounds in his pocket; beſide the feeſimple of one hundred and fifty to two hundred pounds a year, from this allotment only; beſide the advantages ariſing from the remainder of the heath, and the incloſure of the common field; and beſides having done away a nuiſance, and planted induſtry and plenty upon an almoſt uſeleſs waſte: and this, too, without rendering himſelf odious, or his tenants miſerable. IMPROVEMENTS like this are *real*, and bring a *permanent* increaſe to the rentroll of an eſtate.

END OF THE MINUTES.

PROVINCIALISMS

PERTAINING TO THE

RURAL ECONOMY OF NORFOLK.

THE languages of Europe are not more various, or ſcarcely more different from each other, than are the dialects of huſbandmen in different diſtricts of this Iſland.

The practice of a given Diſtrict, therefore, can only be ſtudied in the dialect of that Diſtrict. No converſation can be carried on without its aſſiſtance. And although a man of obſervation may, by obſervation alone, make himſelf maſter of the outline and principal features of practice, yet for the minutiæ, he will find it convenient, and frequently neceſſary, to have recourſe to *converſation*.

But a mere practitioner will not communicate with a man who does not ſpeak his lan-

guage in its provincial purity: taking for granted that he is as ignorant of the ſubject in general, as he happens to be of *his* merely provincial terms. One word awry is capable of putting an end to the moſt intereſting converſation; and of giving the practitioner ſuch an opinion of the obſerver, as to conſider him in future, either beneath his notice, or above his comprehenſion.

The firſt ſtep, therefore, to be taken, by a man who is deſirous of ſtudying the practice of a Diſtrict, is to gain a knowledge of its provincial language: for, until this be obtained, in ſome certain degree, he cannot join profitably in converſation with thoſe who are beſt able to clear up his doubts, and lead him on to freſh diſcoveries.

To acquire with greater readineſs, and retain with greater eaſe and certainty, this neceſſary knowledge, and to indulge, at the ſame time, an inclination to an enquiry into the origin and progreſs of the Engliſh language; I regiſtered the provincialiſms of the Diſtrict, with the ſame aſſiduity I did its practice; and find myſelf poſſeſſed of near a thouſand deviations from the eſtabliſhed language.

But

But the major part of thoſe provincialiſms do not relate eſpecially to rural affairs; but belong to the ordinary dialect of the country; and cannot, with propriety, be introduced here. I have therefore ſelected ſuch, only, as pertain to the ſubject of theſe volumes. I have, however, made the ſelection as ample as this line of conduct would admit of—for ſeveral reaſons.

Such a ſelection will, in the inſtant, ſerve to throw additional light upon the preſent volumes; and may, hereafter, be found uſeful to thoſe who may have occaſion to ſtudy on the ſpot, the rural economy of the Diſtrict.

Other more material benefits may ariſe from a collection of Gloſſaries of the provincial terms of different and diſtant Diſtricts: ſuch Gloſſaries may ſerve to elucidate paſſages in the EARLY WRITERS, on rural ſubjects, which, without their aſſiſtance, might remain inexplicable. And, above all, they may be ſerviceable in aſcertaining the particular Diſtricts in which they ſeverally wrote: a circumſtance, at preſent, little known; though moſt eſſentially neceſſary in fixing the degree of credit which is due to their reſpective works.

A.

A-LADY. Ladyday (in common uſe).
ANBURY. A diſeaſe incident to turneps, See vol. ii. p. 33.

B.

BARNED. Houſed in the barn (a ſimple proper term).
BATTONS. Strong broad fencing rails. See vol. i. p. 85.
BARN-YARD. Straw-yard; fold-yard (a good term).
BECK. A rivulet (invariable).
BEGGARY. Land let down, through a want of proper manure and tillage, is ſaid to be "run to beggary."
To BESTOW. To ſtow away.
BINS. Applied, provincially, to the receptacles of ſtraw in a farm-yard; cow-cribs.
BLUNK OF WEATHER. A fit of ſqually tempeſtuous weather.
BOKE LOAD. A large top-heavy, bulky load.
BRAND. Smut (in common uſe).
BRANDY. Smutty (alſo common).
BRANK. Buck (uſed only in the Southern Hundreds).
BRECK. A large new-made incloſure.
BROADS. Freſh-water lakes: (that is, *broad waters*; in diſtinction to *narrow waters*, or rivers).
BUCK. *Polygonum fagopyrum.* See vol. i. p. 126.
BUCKSTALLING. Cutting hedge-thorns fence-height. See vol. i. p. 101.
BUDDLE. *Chryſanthemum ſegetum*; corn-marigold.
BUDS. Yearling cattle.
BULLOCKS. See vol. i. p. 337.

BULLS,

BULLS. The ſtems of hedge-thorns.
BURGOT, or BEERGOOD. Yeaſt.
BUSH-DRAINING. Underdraining (being done with buſhes).

C.

CANKERS. Caterpillars.
CANKERWEED. *Senecio jacobæa*; common rag-wort.
CANSEY. Cauſeway.
CANSH. A ſmall mow.
CAST. Yield; applied to corn-crops.
CAULK. Hard chalk; or, perhaps, chalk in general.
CHEARY. Careful; ſparing; choice.
CHICKED. Sprouted; begun to vegetate, as ſeed in the ground, or corn in ſwath or "ſhuck."
CHINGLE. Gravel, free from dirt.
CHOAKED. Blown up, or ſufflated, with a turnep in the throat.
CLOTE. *Tuſſilago farfara*; coltsfoot.
COBS. Sea-gulls.
COCKEY. The grate over a common ſewer. Hence, probably, Cockey-lane, in Norwich.
COCKSHEADS. *Plantago lanceolata*; plantain; rib-wort; rib-graſs.
COLDER. See STOVER.
COOMB. Four buſhels; half a quarter.
COSH. The huſk or chaff of wheat and oats.
COTTS. Lambs brought up by hand; cades.
COVEY. A cover of furze, &c. for game.

COW-

COW-PAR. Straw-yard; fold-yard.
A CRINGLE. A with, or rope, for faſtening a gate.
To CRINGLE UP. To faſten with a cringle.
CROFT, or CRAFT. A ſmall common field. See vol. i. p. 8.
CRONES. Old ewes. See vol. ii. p. 28.
CROOM, or CROME. Any thing hooked; as muck croom, turnep crome.
To CROWD. To wheel in a barrow.
CROWDING-BARROW. A wheelbarrow.

D.

DABBING. Dibbling.
DANNOCKS. Hedging gloves.
DAUBING. Plaiſtering with clay.
DAUBY. Clammy, ſticky: ſpoken of land when wet.
DAVYING. See vol. ii. p. 257.
DICK. The mound, or bank of a ditch.
DICK-HOLL. The excavation, or ditch itſelf.
DINDLES. *Sonchus oleraceus & arvenſis*; common and corn ſow-thiſtles: alſo, the taller hawkweeds.
DITCHING. A general term for fencing with hedge and ditch.
DODMAN. A ſnail.
DOGGEDLY. Badly; ſhamefully done.
DOLE, or SEVERAL. A piece of land upon a heath or common, off which only one particular perſon hath a right to cut fuel.
DOLE-STONE. A landmark, or boundary ſtone.

To DOSS. To ſtrike with the horn, or gore ſlightly, as cattle frequently do each other.

DOW, or DOO. A dove, or pigeon (common).

DOWLER. A dumplin (common).

DRAINS. Brewers' grains.

DRUG. A four-wheeled timber carriage.

DRY. Drought: "the crop was caught in the dry."

DYDLE. A kind of mud drag.

F.

FALL-GATE. A gate acroſs a public road.

FAT-HEN. See MUCKWEED.

To FEY, or FAY. To cleanſe,—whether a well, a pit, or corn.

FICKLETOW. The fore-tackle, or carriage, which ſupports the plowbeam.

FLAG. The furrow turned.

FLAGS. Turves, or ſods.

FLIGHT—of BEES, the proper term for a *ſwarm* of bees.

To FLITCH. To move from place to place; as from farm to farm.

FLUE. The coping of a gable or end-wall of a houſe.

FOLLOWERS. Lean ſtore cattle or ſheep, which *follow* the fatting bullocks. See vol. i. p. 290.

FORCING. Fattening.

FOREIGNER. A ſtranger; one of another county; not of the neighbourhood.

To FORGIVE. To thaw.

FOUR-

FOURINGS. An afternoon meal in harveſt.

FULL-PITCH. Plowing the full depth of the ſoil is called "taking it up a full pitch."

FURLONG. The line of direction of plowed lands. See vol. i. p. 131.

FURS. Furzes.

G.

GAIN. Handy; convenient; docile. *Ungain*, the reverſe (much in uſe).

GARGUT, or GARGET. A diſeaſe incident to calves. See vol. ii. p. 125.

GARGUT-ROOT. The root of *Helleborus fœtidus*; bear's-foot.

GATHERING. Rolling corn-ſwaths into cocks or bundles.

GAY. Gaudy; as ſpeckled, light-coloured cattle.

GEER. Stuff; thing (a general term).

GILL. A pair of timber-wheels.

GLADDON, or GLADDEN. *Typha latifolia & angustifolia*; large and ſmall cats-tail.

GOOSE-TANSEY. *Potentilla anſerina*; ſilverweed.

GOTCH. A jug or pitcher (in common uſe).

To GRAZE. To fat.

GRAZIERS. Fatters of cattle; whether their food be graſs, turneps, or oilcake.

GREASY. Foul; graſſy: ſpoken of fallows or other plowed grounds.

The GRISSONS. The ſtairs, or ſtair-caſe.

GROWERS. Farmers. *Great growers*, capital farmers.

GRUB-

GRUB-FELLING. The common method of taking down timber trees. See vol. i. p. 123.

GULPH. A mow, or bay-full, in a barn.

GULPH-STEAD, GOAFSTEAD, or GO-STEAD. A bay, or diviſion of a barn.

H.

To HAIN. To raiſe, or heighten; as, "to hain the rent, the rick, or the ditch."

HAKES. The copſe or draught-irons of a plow. Alſo pot-hooks.

HARDS, or HURDS. Tow.

HARVEST-BEEF. A general term for butcher's meat eaten in harveſt, whether it be beef or mutton.

HAUGHTY WEATHER. Windy weather.

A HAY. A clipt hedge (common).

HEAD. Bullocks are ſaid *to go at head*, when they have the firſt bite; in diſtinction to thoſe which *follow*.

HEAD KEEP. The firſt bite: the beſt the farm will afford.

HECK. A half door.

HECKFOR. Heifer.

HELVE. Applied to handles in general.

HIGHLANDERS. Scotch cattle of the Highland breed.

HILD. Lees or ſediment of beer.

HILDER. Elder.

HOBBIDY. A man-boy (uſed in common).

HOBBY. A hack (in common uſe).

HOGWEED. *Polygonum aviculare*; knotgraſs.

HOLL,

HOLL, or HOL. The hollow of the ditch, in diſtinction to the "dick" or bank of the ditch.
HOMEBREDS. Cattle of the Norfolk breed.
To HORN. To gore or wound with the horns.
HORSE-BRAMBLES. Briars; wild roſe.
HORSE-TREE. Whippin; or ſwingletree.
HULVER. Holly.
A HURRY. A ſmall load of hay or corn.

I. & J.

A JAM. A vein or bed of marl or clay.
To JAM. To render firm by treading; as cattle do land they are foddered on.
JIMMERS. Door-hinges (common).
INWARDS. Intrails; inteſtines.
To JOLL. To job with the beak; as rooks *joll* for worms; or for corn recently ſown.
JOURNEY. Half a day's work at plow or harrow.

K.

KEEPING-ROOM. A ſitting-room.
KERNELS. Grains of wheat, &c.
KIDS, or KID. Faggots; bavins.
KILLER. A ſmall ſhallow tub; a ſmall cooler.
KNACKER. Uſed in common for collar-maker.

L.

LAID. Juſt frozen. When water is ſlightly frozen over, it is ſaid to be *laid*.
LANNIARD. The thong of a whip.

LASH,

LASH, or LASHY. Very wet; as "cold laſhy weather."

LAYER. Plants of hedgewood; quick.

To LATCH. To catch as water, &c.

To LECK-ON. To add more liquor; as in brewing.

LEGGET. A tool uſed by reed-thatchers.

LIFT-GATE. A gate without hinges, being lifted into notches in the poſts.

LIFTING. (Corn in ſwath.) See vol. i. p. 242.

LOBSTER. A ſtote.

LOKE. A cloſe narrow lane (common).

LOWER. A lever.

LUMPS. Barn-floor bricks.

M.

MANNER. Rich mould of any kind collected for the purpoſe of mixing with dung.

MARRAM, or MAREM. *Arundo arenaria*; ſea-reed-graſs.

MARSHES. Fens and ſwamps come under that denomination in Norfolk. See vol. i. p. 320.

MARSHLANDERS. Cattle of the marſhland or ſhort-horned breed.

MAVISH, or MAVIS. The thruſh.

MAUL. A mallet.

MAUTHER. A little girl (in common uſe).

MEADOWS. Low, boggy, rotten graſsland.

MEATY. Fleſhy, but not "right fat."

MERGIN. The mortar or cement of old walls. See vol. i. p. 30.

To MOYS. To thrive; ſpoken of crops and ſtock: alſo in a general ſenſe; as, "he muddles on but does not moys."

MUCK. The provincial and proper name of what is more commonly, but leſs properly, called dung.

MUCKWEED, or FAT-HEN. *Chenopodium album*; common goose-foot.

MUDCROOM. A tool uſed by water-workers. See vol. ii. p. 79.

MURRAIN. See GARGUT.

N.

NEEDLEWEED. *Scandix pecten Veneris*; ſhepherd's needle.

A NIP. A near, ſplit-farthing houſe-wife.

A NOCKLE, or KNOCKLE. A mallet or beetle.

NOGG. Strong beer (common).

NONSUCH, *black*. Trefoil-ſeed.

————*white*. Rye-graſs-ſeed. See vol. ii. p. 179.

NOONINGS. Workmen's dinner-time.

O.

OAMY. Light, porous, floury; ſpoken of plowed land.

OLLAND. Ley-ground (old land).

OPEN. Not ſpayed; ſpoken of a heifer, or a ſow.

OVER-YEAR. Bullocks which are not finiſhed at three years old, if homebreds—or the firſt winter after buying

buying, if purchaſed—but are kept through the enſuing ſummer, to be fatted the next winter, are ſaid to be kept *over-year*; and are termed *over-year* bullocks.

OUTHOLLING. Shovelling out a ditch for the manure it contains. See vol. i. p. 76, and 101. and vol. ii. p. 76.

OWLSCROWN. *Gnaphalium ſylvaticum*; wood cudweed.

P.

PACK-WAY. A bridle road (common).

PADS. See PEDS.

PAN. The flooring on which the cultivated ſoil lies. See vol. i. p. 11.

PAR-YARD. Straw-yard; fold-yard.

PAVEMENTS. Square paving-bricks; flooring-bricks; paving-tiles.

PEDS, or PADS. Panniers.

PETMAN. The laſt of the fare.

PETTY SESSIONS. See vol. i. p. 40.

PICKPURSE, or, SANDWEED. *Spergula arvenſis*; common ſpurrey.

PIGHTLE, or PYKLE. A ſmall incloſure; a croft.

PLANSHER, or PLANCHER. The chamber-floor.

PLAT. The mould-board of a plow.

PLOWJOGGER. A plowman.

PLOWS. Plowed ground; whether cloſes, or pieces in open fields.

POLLARDS. Trees headed down to the ſtem, and cropped or polled, from time to time, for fire-wood. A term general to the ſouthern and eaſtern counties.

POLLER, or POLLEN, or HEN POLLEN. The hen-roost.

PULK. A puddle.

PUTT. A mole-hill (in common use).

To PUT. To stumble, as a horse.

Q.

QUARTERS. The inn a farmer uses at market, &c. is called his *Quarters*: and he is said to *quarter* at such an inn.

QUICKS. *Triticum repens*; couch-grass.

R.

RANNY. The little field-mouse.

RAFTY. Damp and musty; as corn or hay in a wet season.

REDWEED. *Papaver rheas*; round-smooth-headed poppy.

To REAVE. To unroof or disturb the roof.

RED-ROW. When the grains of ripening barley are streaked with red, the crop is said to be in the *red-row*.

REED-RONDS. Plots, or beds of reed: *or*, the swamps which reed grows in.

RICEBALKING. A particular method of plowing. See vol. i. p. 142.

A RIDE. A common name for a saddle-horse.

RIGG. Ridge.

RIN. Brine.

RINGES. Rows, of hay, quicks, &c.

ROADING. Running races with teams, upon the road. See vol. i. p. 44.

ROKE.

ROKE. Miſt, or fog.

ROOFING. The ridge-cap of thatched roofs.

To Rope. To tedder; as a horſe.

ROWEN. After-graſs; latter-math.

S.

SANDWEED. See PICKPURSE.

SCAITHFUL. Given to breaking paſture. Alſo, liable to be over-run by ſtock; as open fields, &c.

SCALDS. Patches of land which are more liable to be *ſcorched*, *burned*, or *ſcalded* in a hot ſeaſon, than the remainder of the piece they are ſituated in.

To SCALE-IN. To plow in with a ſhallow furrow.

SCORING; or, SCOWRING. See vol. i. p. 139.

SCOTCHES. Scores, or notches.

SCOTS. Scotch cattle.

SEEL, or SEAL. Time or ſeaſon; as, "hay-ſeel," hay-time; "barley-ſeel," barley ſeed-time; "wheat-ſeel," wheat ſeed-time: "bark-ſeel," the barking ſeaſon. Alſo, uſed ſometimes in common converſation; as, "what ſeel of day is it?"

SEVERAL. See DOLE.

SHACK. Stock turned into the ſtubbles after harveſt are ſaid to be at *ſhack*. Grounds lying open to common fields are ſaid to "lie quite ſhack."

SHACKING. A ſhabby rambling fellow (living at ſhack).

To SHEAR. To reap; as wheat.

SHELLED. Pied; party-coloured.

SHIFTS. Parts of a farm allotted for the reception of ſtock or crops. See vol. i. p. 131.

SHOTS. Young ſtore ſwine.

SHUD. Shed.

To SHUG. To ſhake; as hay, &c.

SHUGGINGS. That which is ſhed or ſcattered, as corn at harveſt.

SHY. Harebrained; high-mettled; head-ſtrong; as wild colts, &c.

SINGULAR. Lone or ſingle; as a ſingular houſe, or farm.

SKEP. A coarſe round farm-baſket; alſo a bee-hive.

SLADE. Sledge.

To SLADE DOWN. To draw back part of the mould into the interfurrow, with the plow dragging, or *ſlading* upon its ſide.

SLAKE. Leiſure: "to be at ſlake," to be at leiſure.

SLOBBERERS. Slovenly farmers.

SLOB-FURROWING. A particular method of plowing. See vol. i. p. 142.

SLUSS. Mud; mire.

SMARTWEED. *Polygonum hydropiper et Pennſylvanicum*; biting and pale-flowered perſicarias; ar ſmart.

SNAIL-HORNED. Having ſhort down-hanging horns, with blunt points, and ſomewhat bent, in the uſual form of the ſnail; ſpoken of cattle.

To SOL. To pull by the ear, as a dog pulls a ſow.

SPARKLING. Claying between the ſpars to cover the thatch of cottages (ſpar-claying).

SPIRKET.

SPIRKET. A hook to hang things on.

SPOULT. Brittle, ſpoken of wood, &c.

SPURWAY. Bridle-road.

SQUALLY. A crop of turneps, or of corn, which is broken by vacant unproductive patches, is ſaid to be ſqually.

To SQUINDER. To burn inwardly; as charcoal, &c. are burnt.

STANDS. Young timber-trees under ſix inches timber girt, or twenty-four inches in circumference.

STARK, or STUCK. Tight, or ſtiff.

STATESMEN. Yeomen; ſmall owners.

STOCK. Species of a crop. See article TURNEPS, &c.

STONDLE. A bearing tub.

STOPS. Small well-buckets.

STOVER. A general term for the different ſpecies of fodder ariſing from thraſhed corn, whether it be ſtraw, chaff, or "colder;" a provincial term for the ſhort ſtraws, ears, and rough chaff, which are ſeparated from the corn-in-chaff, by the rake and the riddle, after the ſtraw is ſhook off the floor; and which, in every country, has a provincial term aſſigned it; but totally different in different Diſtricts.

To STOW. To confine; as cattle in a yard or pound.

STUBWOOD. All wood which grows in hedgerows and does not come under the denomination of "timbers," "pollards," or "thorns," is called "ſtubwood."

STULP. A poſt of any kind.

SUCKLING.

SUCKLING. *Trifolium repens*; white clover.

SUMMERLY. A turnep-fallow. *A backward ſummerly*; an autumnal wheat-fallow: *a right-out ſummerly*; a whole year's fallow.

SWALE. Shade.

SWAYS. Rods, or ſwitches.

SWINGLE. A crank.

T.

TACK. Subſtance, ſolidity, proof; ſpoken of the food of cattle and other ſtock.

TAR-ROPE. Rope-yarn; the thread of old cables, &c.

TASKER. A thraſher.

TEAMER. A team of five horſes.

TEAMERMAN. A waggoner, carter, or driver of a teamer.

TEATHE. The dung, &c. of cattle. See vol. i. p. 33. *

THAPES. Gooſeberries.

THIGHT. Applied to turneps or other crops,—cloſe, thickſet: applied to roofs or veſſels,—impervious—oppoſed to leaky.

THACK. Thatch: *thackſter*, thatcher.

THONE, or THONEY. Damp, limber, as under-dried hay.

To TOP-UP. To finiſh highly; as fatting bullocks.

TRIP. Of ſheep;—a ſmall flock.

TURF. Peat.

TWO-FURROWING. Double plowing; trench-plowing; ſod-burying.

* This term is probably of Scotch origin.

VALLEY,

V.

VALLEY. Any ſmall hollow or channel; as a gutter in a roof.

VANCE-ROOF. The garret.

VARDLE. A common eye or thimble of a gate, with a ſpike only.

U.

UNCALLOW. The earth which covers a jam of marl.

UNDER CORN. Short, weak, underling corn, overhung by the crop.

W.

WALLACE. The withers of a horſe.

WARBEETLES. The large maggots which are bred in the backs of cattle.

WARPS. Flat wide beds of plowed land.

WATER-WORKERS. Makers of meadow-drains and wet ditches.

WELL. A chimney or vent-hole in a rick or mow.

WINTER-DAY. The winter ſeaſon.

WINTER-WEED. *Veronica hederifolia*; ivy-leaved ſpeedwell.

WISP. A rowel, or ſeton.

WOODBOUND. Land which is encumbered with tall woody hedgerows, ſo as to hinder a free admiſſion of ſun and air, and thereby prevent it from exerting its natural ſtrength and fertility, is ſaid to be woodbound.

WOOD LAYER. Young plants of oak, or other timber, laid into hedges among "white-thorn-layer."

WRECK. Dead undigeſted roots and ſtems of graſſes and weeds in plowland.

WRETWEED. (That is, wart-weed). *Euphorbia helioſcopia*; ſun ſpurge.

WRONGS. Crooked arms, or large boughs, of trees, when the faggot wood is cut off.

GENERAL

GENERAL INDEX

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